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AN ASSESSMENT OF ALAMO COMMUNITY COLLEGE DISTRICT'S ROLE IN EXPANDING ECONOMIC DEVELOPMENT THROUGH CUSTOMIZED WORKFORCE TRAINING: THE TOYOTA PARTNERSHIP

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by

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In loving memory of my father,
Roberto Hiram Solis-Flores
And in honor of my mother,
Esther Baker Solis

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Community colleges attract businesses and play a factor in their expansion, thereby increasing employment and prosperity. However, there is limited evidence that major industry recruitment, such as automotive manufacturing, occur as a major result of the presence of community college strategic programs and their participation in economic initiatives.

This study was conducted to explore selected economic development strategies used by the Alamo Community College District to respond to the economic growth, specifically, identifying the strategy employed to develop and promote the Team Toyota recruitment of the truck manufacturing plant. This study was prompted by the perilous interest of communities in attracting, retaining, and retraining a highly competent workforce in the New Economy. Understanding the dynamics and role that the district plays in fostering economic prosperity is

critical. The district's workforce initiatives are the key to this understanding and the focal point of this study has been the recent Toyota plant acquisition in an effort to gain a clear perspective on how the district encourages economic development in the San Antonio region.

This study was designed using qualitative methods in order to provide a descriptive understanding from leadership participants. The results of this study indicate that the respondents and key participants in the Team Toyota initiative strongly support the premise that workforce education provided by the college district is essential to economic development efforts and, more importantly, was decisive in the Toyota truck project. The availability of a qualified workforce was the overwhelming factor highlighted by all participants as the nexus of the economic development for the region and as a vital factor for Toyota Motor Corporation to favor Texas. Simultaneously, the partnerships from the Alamo Community College District were portrayed as key to facilitating this qualified workforce by providing the customized training needs of business and Toyota. Additionally, the basic location factors identified in the recruitment strategy which made San Antonio a suitable site were those related to the specialized production requirements of Toyota Production Systems.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

> The community college is a cornerstone of good economic policy… and it's one of the reasons we will continue to lead the world in innovation and change.
>
> —George W. Bush, 2004

Overview

We live in a continuously changing world where the pace of change is increasing rapidly. Peters (1994) uses the term "revolution" rather than "change" to characterize the pace of transformation in the world of work. American workers must adapt and learn new skills or find themselves obsolete in the new global workforce. Many Americans turn to community colleges for this new skill development (Cohen and Brawer, 1996).

As the United States enters the 21st century full of optimism and promises, many diverted challenges and issues appear in the realm of workforce and economic development. Rapidly changing technology, shifting demographics, and the growing importance of human capital characterize the American economy of the new millennium. These factors require workers to achieve an increasingly higher level of formal education and to pursue ongoing, continuous training and development throughout their careers. Federal and state agencies and the business and education communities are working together to find ways to meet the growing demand for both education and training.

Current economic forces, especially the influence of technology, challenge higher education institutions to intensify their mission in retraining and educating the adult

workforce. Boyer and Hechinger (1981) report that "[Higher education] has an inescapable responsibility to transmit knowledge that would be useful, not merely in the classical sense of preparing [young people], but for the practical demands of a changing world" (p. 5). Chmura (1986) remarked:

> In today's economy universities encounter pressure to play a more active role in the economic development of the nation's cities, states, and regions. Their knowledge-based resources now constitute an essential element in the new economic infrastructure that the nation needs to compete in a highly competitive, technologically advanced, and rapidly changing global economy. (p. vii)

Perhaps more than four-year institutions or universities, community colleges nationwide have been charged with the mission of facilitating economic development. Many reasons contribute to their fundamental role. As Apps (1988) says, "To their credit, community colleges frequently have a more flexible structure, which allows them to more quickly respond to community requests and societal change" (p. 210). Because community colleges lead the effort in providing skilled workers, community college leaders must be involved in all initiatives that have an impact on the workforce and on the community (Forde, 2002).

Although academic preparation is still a core function of community colleges, their mission today is more comprehensive, gradually shifting toward economic development, specifically workforce, job training, and community development. The need to link economic and workforce development strategies is more important today than ever before. Economic development is the intentional process of finding, sustaining, and capitalizing on the advantage of location to create wealth and minimize poverty

(Grubb, Badway, Bell, Bragg and Russman, 1997). When the private sector builds new factories or creates new service centers, local productivity tends to rise, and the demand for higher skill/higher wage jobs goes up. Workforce development is the intentional process of strengthening the local talent pool of workers to match private sector investments in technology, capital, and product improvement (Grubb et al, 1997). Correspondingly, the main goal of workforce development is to connect job seekers with job providers and then to connect both job seekers and employers with ongoing education and training programs. As a result, a distinction is made between *ongoing education* and *training programs* because they generate different activities, though they share the purpose of serving employers and increasing a community's economic strength. In workforce development, community colleges respond to the education and training needs of local employers by adapting traditional schedules or content in nonstandard formats. In economic development, the community college today plays a minor but increasingly crucial active role in generating employment rather than simply responding to existing demands by local firms.

The career and technical education system in the United States is perceived as the best in the world, and only with a focus on the future and a commitment to quality concepts will the nation have the resources necessary to sustain its competitive edge.

> Only in educating technologists can the developed countries still have a meaningful competitive edge….The United States is the only country that has actually developed this advantage—through its so far unique nationwide system of community colleges. The community college was actually designed (beginning in the 1920s) to educate technologists who have both the theoretical knowledge and the manual skill. On this, I am

> convinced, rests both the still huge productivity advantage of the American economy and the—so far unique—American ability to create, almost overnight, new and different industries. Nothing quite like the American community college exists anywhere so far. (Drucker, 1999, p.151)

Those who address the challenges of the new economy today and prepare for the future, the innovators and early adopters (Moore, 1999; Rogers, 1983; Rogers and Shoemaker, 1971), will be the leaders and dominate tomorrow. "Those who wait until these challenges have indeed become 'hot' issues are likely to fall behind, perhaps never to recover" (Drucker, 1999, p. 9).

The new economy is changing the way public and private sector organizations approach the issue of workforce development, and higher education institutions continue to emerge as a major resource for both needs-based workforce training and state-directed training incentive programs designed to influence firm location, expansion or hiring decisions.

> A company's decision to expand or relocate often involves a multimillion dollar investment. For most manufacturing companies, labor costs constitute their major operating expense. Success or failure depends upon their ability to understand and incorporate this cost information into the decision-making process. (King, 2000, p. 2)

The connection between increased productivity and workforce development is notable. The 1997 *Economic Report to the President* (as cited in Hartzer, 2000) revealed that increased training and education accounted for 27% of the recorded increases in productivity between 1973 and 1994. Moreover, the workforce-related challenges facing

American companies are tremendous, and finding the necessary resources to address the demand for workforce development is not a simple task.

It is not surprising that the demand for high-quality, affordable training has been identified as a key factor in stimulating economic development in the new economy, and the knowledge worker is identified as the key to the future (Drucker, 1999; Gamble, 1999; Gamble, 2000; Gray and Herr, 1998; Greenspan, 2000; Hartzer, 2000; Herman, 1999; National Governors' Association, 2000). In order to provide business and industry with the new worker—the knowledge worker—it is increasingly essential to create more partnerships between business and education (Crist, Miller, and Presley, 1996; Greenspan, 2000; Herman, 1999a, 1999b; U.S. Department of Labor, 1992). Responsiveness by career and technical education institutions to the training needs of existing, new, and expanding business and industry is critical to economic development. While several types of public-sector career and technical education institutions provide customized training to business and industry, the literature most often cites the community college system. Central to the mission of community colleges, as well as to other career and technical education institutions, is responsiveness and service to the community (Roueche, Taber, and Roueche, 1995). As America's business environment becomes increasingly global, technology-based, and highly competitive, companies are beginning to realize that information, technology, communications, and intellectual capital, rather than energy and raw materials, power today's businesses (Gray and Herr, 1998; National Governors' Association, 2000). Workforce skills, therefore, are the most

serious competitiveness hurdle for the United States in the next decade (National Institute of Standards and Technology, 2000). Workforce development is increasingly identified as a significant factor, if not the most important factor, related to the competitiveness of business and industry in a global economy.

> Those factors that make a country's firms competitive, factors that give it a strategic advantage in commerce and that allow it to produce goods and services of the best quality at the best price, become in fact, essential to a nation's economic wealth, its economic growth, and the standard of living its citizens enjoy. Workforce education [development] is one of these factors and arguably the most important. (Gray and Herr, 1998, p. 42)

Business and industry face enormous challenges, and the key issue in economic development is workforce development. Its role is so critical to economic development that President Bush recognized the urgency to advocate a stronger role for the community college in workforce by proposing a new initiative to expand the workforce training capacity at community colleges.

> Community colleges play a leading role in meeting extreme labor shortages. Community colleges provide the broadest array of programs to deliver high-quality and cost-effective education to those who are unemployed, under-employed, or seeking to enhance their career prospects and quality of life. (President Bush, 2004)

The new plan will infuse $250 million into training partnerships among community colleges and businesses with a high demand for workers.

> The highly positive reaction among members of Congress to the President’s proposal was clear, this initiative marks the beginning of a new federal commitment to community colleges and their role in promoting economic growth and individual prosperity. (Boggs, 2004)

Communities will not have the qualified and certified skills necessary to attract or retain companies providing quality jobs without a well-trained base of workers (Gamble, 1999; Gamble, 2000; Luttrell, 1996). In turn, colleges that embrace these challenges and the mission of workforce development seek to meet rapidly changing local economic development needs.

Historically, the task of community colleges has included both workforce and economic development (Eells, 1931), even though those activities have not always been identified in those terms. In the area of economic development, community colleges have contributed most through vocational education programs designed to provide people with the skills and abilities required to enter the workforce (Bogart, 1994). As in the past, community colleges have continued to offer core programs that are similar throughout the country; however, they also design programs to meet the unique needs of the regions they serve (McNutt, 1995). During the past 20 years, the community college's responsibility has expanded in the area of economic development (Dougherty and Bakia, 1999; Drury, 2001; Forde, 2002; Levin, 1999; Tollefson, 1998; Young, 1997).

Community colleges face many challenges, but the task of educating students to enter the ever-changing workplace is critical. The critical issue is not too few jobs, "but too many people without the skill levels to perform the available jobs" (Roueche and Roueche, 1993). According to Zeiss (2000), the lack of trained and skilled workers is the greatest economic challenge to communities. "Communities are faced with creating, keeping and attracting businesses that provide high-wage employers while most of their

citizens need extensive education, training and re-training" (p. 49). The American Association of Community Colleges (2002) reports that 65 percent of all future jobs will require training beyond high school. Community colleges must educate and train new entrants for the job market and retrain those who lose or change jobs. American companies compete in a global economy, and community colleges must develop or update programs to train and educate students properly to satisfy business and industry requirements (Gannell, Johnson and Wilson, 2001). The global economy, the labor market's changing requirements, and new demands from local, state, and federal governments emphasize on the role of the community college in economic development (Levin, 1999, 2001; Tollefson, 1998).

Strategic participation results in economic development initiatives as counties and community colleges collaborate on measures to gauge effectiveness and trace successes (Forde, 2002). Collaboration builds relationships, which often lead to additional effective business partnerships.

Forde (2002) believes that community colleges are at the center of the economic development universe because they transition people from varying educational levels to complete college and enter fulfilling careers. Being at the center means that college and community leaders must be at the core of that universe, committed to sharing the same vision and resources. Alliances, then, are critical until the core group is firmly established, the mission is clear, and resources have been distributed.

According to Kopecek (1991), strong leadership and community partnerships must be present for economic growth to occur. Likewise, the workplace has always looked to community colleges to train and retrain its employees. The role of community colleges, however, has expanded to include economic development activities, ranging from small business assistance to economic development partnerships. Those activities provide both financial and educational support to ensure economic growth. In addition, participating in economic development activities requires community college leadership to make decisions about how to advocate what is best for the college and the community. By virtue of their mission and their central relationship to the community, community colleges have the responsibility of determining how they can serve the community and position themselves as vital assets (Zeiss, 1986).

The role of the community college has evolved into a key component in fostering economic development efforts by addressing the workforce development needs of American businesses so that they can remain competitive within the global economy and marketplace (Wismer, Zeiss, and Barber, 1998). Heelan (2000) states that "preparing a workforce to keep America productive is one of the most important contributions community colleges can make to economic development in these early days of the 21st century" (p. 6). With the informational age firmly engaged with the global economy, the need for a highly skilled workforce continues to be a primary concern of businesses and industry leaders in America and other worldwide countries (McCabe, 1999). As stated by Braddock (1999), between 1998 and 2008, the U.S. employment outlook is projected to

increase by 20.3 million jobs. Of the projected 20.3 million additional jobs, 70% of these jobs will require workforce training and an educational level beyond a high school diploma (Braddock 1999).

To assure America's competitive posture in the global market place, community colleges must play a critical role in keeping America's workforce educationally prepared and equipped with the skills required to meet the needs of business and industry leaders (Warford and Flynn, 2000). Davis and Wessel (1999) report that "Community colleges are doing what other educational institutions in America aren't doing: preparing people, often those with mediocre basic schooling, to get well-paying, middle-class jobs" (p. 153).

The Focus of the Study

This study examined the Alamo Community College District (ACCD), which includes four accredited colleges, making it the second largest community college district in Texas. ACCD is the largest provider of postsecondary education in San Antonio, in Bexar County, as well as the 11 surrounding counties, with an annual operating budget of $186 million. ACCD reported a fall 2003 enrollment of 63,599 students, of whom 41,570 were full- and part-time credit students, and 22,029 were enrolled in continuing education and workforce development courses.

The colleges of the Alamo Community College District include: (1) St. Philip's College (established in 1898) the oldest, now enrolling 8,459 students; (2) San Antonio

College (established in 1945), the largest, with 21,178 enrolled; (3) Palo Alto College (established in 1985), strategically located in the southern sector of the city with 6,547 students; and (4) Northwest Vista College (established in 1998) with 7,200 students.

The Texas Higher Education Coordinating Board (1995) says that to take the lead in workforce education, public community colleges must increase and enhance responsiveness and flexibility to insure that career preparatory needs are linked with business and industry workforce needs. Correspondingly, the training of a technically competent workforce has emerged as vital to all "members of the field" (Roe, 1989, p.1). However, technology outstrips the abilities of the workforce, and rapid demographic changes exacerbate the technical gap (Gonzales, 1991). "Colleges must accept the fact that America's workforce has changed and that our educational institutions must change with it or they will cease to exist as we know them today" (Gianini and Sarantos, 1995, p. 206). Community college leaders, therefore, must comprehend how to clarify and incorporate their institutions as economic development and workforce intermediaries. As in San Antonio, community colleges throughout the country are focusing on economic development services. The charge to community colleges to serve as a catalyst for economic development originates from a variety of sources including local, state, and federal governments (Tollefson, 1998). Thus, community colleges are discovering the exigencies of economic development activities as core aspects of their mission.

Statement of the Problem

The dynamics of community college workforce programs are not fully understood in the context of influencing economic development. The Alamo Community College District actively participates and takes a leadership role in a myriad of economic development strategies that serve the needs of the San Antonio region. ACCD leaders must examine their economic development roles and need to recognize how to position their district to be central to economic development and workforce training. Therefore, the district must understand the influence that their workforce programs play in economic development. This study examined particular programs and services employed by the district as a response to community economic growth, specifically identifying the customized workforce training programs developed to promote the team Toyota recruitment.

Purpose of the Study

The Alamo Community College District (ACCD) strives to meet the needs of San Antonio and its surrounding counties. The district has expanded the role of the four colleges to emphasize creating workforce programs to promote economic development in the San Antonio area. This study identified selected workforce development programs ACCD implements for the region's economic development. Likewise, it illuminates specific economic development activities considered by both business and academic leadership as most significant. Further, the study specifies the strategic programs

fundamentally designed to contribute to the decision process for the acquisition of the Toyota truck assembly plant.

Research Questions

1. What is Alamo Community College District's role in meeting its community's workforce and economic development needs?
2. What particular strategies does the district believe are most successful in attracting business and industry partners?
3. What strategies did ACCD take to attract the Toyota auto plant project?
4. How does the Toyota Team perceive that the district best positioned themselves to attract the auto plant project?

Methodology

This case study used qualitative techniques to gather data and used appropriate techniques for analysis pertinent to the research questions and for the purpose of understanding higher education and economic development. "Qualitative methods are necessary to capture the unique diversities and contrasts that emerge as local programs adapt to local needs and circumstances" (Patton, 1990, p. 102). Denny (1978) defines a case study as "an intensive or complete examination of a facet, an issue, or perhaps the events of a geographic setting over time" (p. 48). This approach enabled the researcher to gather the needed information. "The descriptions of the case should be holistic and

comprehensive, given the focus of evaluation, and will include myriad dimensions, factors, variables, and categories woven together into an idiographic framework" (Patton, 1990, p. 43).

The unit of analysis was the Alamo Community College District. A naturalistic inquiry method facilitated the study as it "minimizes research manipulation by studying naturally unfolding programs or traditional processes and impacts" (Patton, 1990, p.43). The researcher focused on workforce and economic development activities in detail in the context of college and city leaders' perspectives. The study also includes an account of the Alamo Community College District's participation in the recruitment of the Toyota manufacturing plant as a demonstration of the district's contribution to economic development.

Definition of Terms

Clusters in the economic development practice are a *geographically* bounded concentration of interdependent businesses with active channels for business transactions, dialogue, and communications, and that collectively share common opportunities and threats. The presence of clusters generates specialized skills, new knowledge, innovation competition, opportunities for cooperation, tailored infrastructure, and often attracts specialized support and other services and related businesses (Rosenfeld, 1995).

Contract training is an arrangement under which an organization—a business, a government agency, or a volunteer association—contracts directly with a college "to instruct its employees, clients, or members" (Alsanian, 1988).

Customized training is implemented to improve current or prospective employees' job skills and academic skills. Customized training is provided under contract to employers or to government agencies (Dougherty and Bakia, 1999).

Economic development is a process of innovation that increases the capacity of people and organizations to produce goods and services and thereby create wealth. Federal, state, and local governments rely on economic development policies to increase productivity, create employment opportunities, increase employee income potential, and improve employees' quality of life (Chmura, 1986). Such policies usually start with building an effective and productive workforce.

Human capital is what workers bring to a job besides their physical presence, such as energy, motivation, skills, and knowledge, which can be harnessed over time to produce goods and services (Cross and McCartan, 1984).

Information economy results from shifting products to services, from physical resources to human resources, from investment in machinery to investment in knowledge, from capital intensity to knowledge intensity, and from a domestic economy to a global economy (Cross and McCartan, 1984).

Workforce in an organizational context is the workers that an organization employs, and in a national context, "the total number of people employed or seeking employment" (*InvestorWords Glossary*, 2001).

Workforce training and *workforce development* are activities, formal or informal, designed to improve on-the-job performance or enable a learner to acquire a new skill. The terms are used interchangeably in this study, unless otherwise indicated, and refer to formal training conducted for business and industry (Collier, 1996).

Knowledge economy is "an economy that is driven by ideas and knowledge…an economy in which the keys to job creation and higher standards of living are innovation and technology embedded in services and…products…. [The] raw resources of the knowledge economy are information and people with the skills to continuously convert information into new knowledge, products, and services through innovative thinking." (Internet Time Group, 2000)

Significance of the Study

This study contributes to increased awareness concerning ACCD's response to the region's economic development efforts. Additionally, the study enhances the perception of the districts valuable contribution to San Antonio's recruitment strategies to attract prospective industries, particularly the Toyota automotive plant. It examined the need for better communication and understanding between academic and business leaders regarding the validation of community colleges and the opportunities generated toward economic development.

Limitations of the Study

This case study focused on Alamo Community College District and its four community colleges in the city of San Antonio. The study's primary limitation is the potential of its findings for generalization. Specifically, the study focused on one of the many aspects of a comprehensive community college's mission (i.e., promoting economic development). The study includes responses from presidents in the ACCD system and from the city's economic development leaders. The study presents the perceptions of selected economic development roles of the district, derived from reviews of previous studies, publications, and personal interviews. Since the project to acquire a new Toyota auto manufacturing plant is currently under construction, the study includes limited research from Toyota corporate employees and no research from students in the college workforce education programs. The study covers only one exemplary college district. The researcher acknowledges that other college districts may also have successful workforce and economic development systems. Equally important, although there were many elements contributing to the economic development efforts of San Antonio, notably in the Team Toyota recruitment, this study primarily focused on one selective key factor of site location decision making: The availability of a skilled workforce and the educational role and programs responding to this demand provided by ACCD.

Conclusion

The intent of this study was to explore community colleges' responses to the field of economic development and improve the understanding of the role these institutions perform in workforce development. The study centers on an in-depth examination of a large college district with a successful systemic workforce program for contributing to workforce and economic development recruitment efforts. The study's second chapter summarizes literature pertinent to the role of higher education in economic development, as well as the evolution of the field of workforce and economic development. The study also addresses ACCD's participation in particular designated workforce development. Chapter Three describes the research techniques used in answering the research questions, as well as the rationale for their use. Chapter Four presents the data gathered from the qualitative research, and Chapter Five interprets the data. Chapter Five also includes comments on future steps for continuing research on the problems associated with community colleges in economic development, as well as recommendations.

CHAPTER TWO

REVIEW OF THE LITERATURE

> It is clear that for America to remain competitive and prosperous, we must expand the pool of available workers and ensure that all workers are as well trained and productive as possible. Workforce issues are a top priority. (Tom Donohue, President and CEO, U.S. Chamber of Commerce, 2001)

Theory of Economic Development

Few authors define clearly what economic development means, except in the context of their writings. In most cases, the author synthesizes a definition. Goetsch (1988) describes economic development as "the process of creating new jobs and retaining existing jobs by mobilizing resources to attract new businesses while helping existing ones to prosper" (p. 39). Sanders (1988) portrays economic development as "organized, planned, and cooperative efforts between the public and private sectors designed to improve economic conditions in community and state" (p.117). Blakely (1991) and Wolman and Spitzley (1996) provide a working definition of economic development as the systemic, organized promotion of economic growth and business activity of all kinds that "seeks to encourage new business activity that results in net dollar income or the infusion of money into the community" (Wolman & Spitzley, p. 115). McNutt (1986) defines economic development as "the process by which interested individuals and organizations are inspired to invest capital in an area. The resulting economic activity generates or expands industrial, commercial, or service enterprises,

creates new jobs and retains others." Two documents define economic development in the context of educational literature. First, the American Vocational Association says economic development is a set of planned interventions within the normal economic process designed to improve the quality of life in a state or community (Paul and Carlos, 1981).

Second, a national study by the Arizona Office of Economic Planning and Development and the Arizona Commission for Postsecondary Education (Wilson, 1982) provides a narrower, focused definition of economic development: Directed activities that contribute to job creation either through expansion or relocation of business and industries.

Many documents use the terms "economic growth" and "economic development" often interchangeably and generally make no distinction between them. Differences became clearly distinguishable only when the literature on economic development is reviewed outside of education (e.g., business and commerce). Economist Larry C. Lebedur (1977) differentiates economic growth from economic development:

> Regional economic growth increases the total value of goods and services produced and the aggregate income generated within a region. Associated with economic growth are increases in employment and population. Regional economic development increases the quality of life and standard of living sustained by the residents of a region. (p. 5)

The definition for economic growth is a quantitative measure and does not imply qualitative outcomes (*i.e.*, quality of life), as does the definition of economic development. Economic growth without economic development is possible, as is

economic development without economic growth. Lebedur (1977) refers to the relationship between development and growth as one of defining outcomes or criteria of measurement. The relationship between development and growth becomes apparent as goals and priorities for economic development are clarified.

Quality of Life

The "quality of life" outcome goal mentioned consistently throughout the literature was ambiguous. The U. S. Office of Management and Budget offers a comprehensive definition for quality of life in a book published by the Environmental Protection Agency (1973):

> Quality of life objectives are good health and long life, freedom from crime and fear of crime, sufficient education to maximize abilities, the ability to work at a satisfying and rewarding job, income to cover the necessities of life with opportunities for improvement, comfortable housing within a congenial environment, and time, and opportunities for discretionary activities (as cited in Lebedur, 1977, p. 11).

The objectives were comprehensive but difficult to measure, a difficulty not unique to quality of life terms, but applicable to most outcome measures of economic development, which may explain why the literature contains little empirical research.

An examination of the quality of life definition would lead most to agree with the economic development planner David Hartley (1977) that "economic vitality underlies quality of life" (p. 113). Not surprisingly, economic growth and development concepts are embodied in definitions or discussions of economic development. Economist and attorney Richard Winnie (1977) comes closest to the pure definition of economic

development: “Economic development seeks to improve the duration and stability of individual employment, to increase their income, and maintain citizen satisfaction with the quality of life, while avoiding detrimental impacts on the environment and energy reserves” (p. 139).

In 1984, Kingry expanded Winnie’s comprehensive definition:

> Economic development is a set of planned interventions within the normal economic process designed to improve the duration and stability of individual employment, to increase their [collective] income, and to maintain citizen satisfaction with the quality of life, while avoiding detrimental impacts on the environment.” (p. X)

Kingry’s definition, used in this study, contains the elements of change from the status quo, economic growth, quality of life, and environmental protection.

Goals and Objectives of Economic Development

Several models of economic development exist in the literature but none specific to community colleges were apparent. Some generally accepted goals and objectives of economic development that pertain to community colleges are:

1. Use community college staff to provide community leadership (Groff, 1981; Hamill, 1982). This objective was particularly applicable to the relocation model where high-level college staff participates on industry recruitment teams, and also to the prevention intervention model in community development planning.

2. Improve the state's image to business and industry (Hamill, 1982). The Oregon Economic Growth Plan (1982) mentions this objective specifically as essential for industry recruitment.
3. Conduct activities to create, develop, and preserve jobs (Bushnell, 1980; Arns, 1981; Bolino, 1981; Paul and Carlos, 1981). Definitions of job creation, job development, and job preservation tended to overlap. The American Vocational Association differentiated between the terms and then used the term "job creation" in discussion to encompass all three (Paul and Carlos, 1981): "Job creation is the expansion of work opportunities through the formation of new businesses or the expanding of existing opportunities. Job development is the change or modification of existing jobs by changing production procedures. It also may include expansion of work opportunities by redefining a job description into two or more positions or by convincing an employer that an additional person is needed. Job preservation is saving existing work opportunities from extinction or loss by relocation"(p.12).
4. Develop the educational segment of the public infrastructure (Jeacock, 1977; Kinnick. 1982). This objective indicates that the college's very existence has an economic impact on monetary circulation in the region.
5. Increase employment and reduce unemployment (Braden and Paul, 1979; Bolino, 1981). This objective was germane to all four models and perhaps the primary objective of most economic development programs.

6. Improve productivity (Turner, 1980; Yarrington, 1980; Bolino, 1981; Jackman and Mahoney, 1982). This objective was based on the theory that developing human resources under the expansion model leads to improved productivity. (*See* "productivity" discussion.)
7. Provide services to existing businesses (Hamill, 1982). This objective supported both the entrepreneurial model with business skills development services and the expansion model with special courses, business centers, and placement services.
8. Develop community economic development plans (Groff, 1981; Hamill, 1982). This objective supported all four models and could conceivably have been a sub-objective under # 1, *viz.* "provide community leadership."

History of Economic Development

In the South, economic development efforts historically have relied on low wages and low-cost manufacturing facilities. This cornerstone strategy of rural development is in trouble due to the expansion of technology and global competition. Rural communities rarely have employees with the skills necessary to compete in an environment of high quality and flexibility (Rosenfeld, 1992). Pressure to develop employment opportunities for the rural workforce is increasing, and economic development agencies are working with employers and educational agencies to develop a workforce that can compete in a global environment.

In the past, communities could depend on some type of aid from state and federal government to support economic development activities. In the twenty-first century, federal aid has decreased and communities must find funding from other sources (Clark and Gaile, 1992). As federal funding decreases, funding from state and local sources must increase.

Development efforts can be described in one of three ways. First-wave development efforts, sometimes called "smokestack chasing," were primarily federally funded in the 1970s and 1980s. Localities developed land use controls, public services, and infrastructure to lure industries. In the second wave, cities used revolving loan funds, below market loans, and other incentives to develop existing businesses and generate new business start-ups (Bartik, 1991). The third wave of economic development moves to an entrepreneurial approach (Bradshaw and Blakely, 1999), a more attractive economic development strategy as city governments create regional partnerships.

Third wave, state-sponsored strategies move away from costly incentive programs and emphasize leadership, information, and cooperative initiatives (Bradshaw and Blakely, 1999). The third wave incorporates first and second wave efforts into a system of collaboration to facilitate recruitment, expansion, and creation of businesses to make the region more attractive for business development. Third wave strategies focus on using economic development efforts rather than replacing them. Research Triangle Park (RTP) in North Carolina is an example. Centrally located between three research universities (North Carolina State University, the University of North Carolina, and Duke

University), RTP was created as a focal point for strategically linked firms to leverage capital and human resources to increase cooperation and collaboration.

Traditional Economic Development Activities

Communities throughout the United States established community colleges to promote local economic development (Dougherty and Bakia 1999; Eells, 1931; Katsinas and Lacy, 1984). The most basic role of community colleges in economic development has been their mere presence in a community. Stout (1996) found that community colleges affect local communities economically in five ways: 1) college students' purchases from local businesses, 2) the colleges themselves, 3) visitors, 4) the colleges' consumption benefits, and 5) college faculty and staff purchases from local businesses. A community college, therefore, affects a region's economic climate. Pennington, Pittman, and Hurley (2001) report that community colleges impact the economic development of a community by 8-11%.

Cohen and Brawer (1996) define the core purposes of community colleges as remedial education, transfer education, vocational education, and continuing education, all components of traditional community college economic development activities (Young, 1997). By teaching basic skills, remedial education prepares students for an increasingly knowledge-based economy and a workplace in which 65% of jobs require advanced reading, writing, mathematical, critical thinking, and interpersonal group skills (Phipps, 1998). Transfer education promotes economic development by offering the first

two years of education for professionals (Young, 1997). While remedial education and transfer education both relate to economic development, community colleges' primary traditional activities in economic development have been vocational and continuing education.

Community colleges have contributed to the growth of local economies in several ways: (a) direct economic benefits from the college's presence in the community via taxes and purchases; (b) preparation of students entering the workforce; (c) improved literacy rates in the service area; (d) providing the first two years of baccalaureate education; (e) offering courses for specific businesses; (f) providing prescreening services for employment; and (g) offering placement services for students (Falcone, 1994; Zeiss, 1989). As noted earlier, Dougherty and Bakia (1999) believe that community colleges are involved in local economic development activities through contract training, small business development and incubation, and local economic planning. Boone and Gillett-Karam (1996) found that while community colleges are involved in economic development, they use only a few strategies to serve their regions. More can and needs to be done to assist public and private economic development agencies, particularly in rural areas. Community colleges are well suited to meet those needs.

Cote and Cote (1993) studied the involvement of land-grant institutions in economic development and found their most common activities were industry-sponsored research, consultation, technology extension service, liaison programs, and cooperative seminars. They also found that the most important motivational factors were industry

sponsorship, regional economic revitalization efforts, and the visions of college presidents, state governments, and legislators. Clearly, presidential and governmental leadership is the driving motivational influence on economic development.

Categorizing the myriad of economic development programs into quantifiable activities has been attempted on several occasions. According to Kopecek (1991), there are two types of economic development activities that are likely to occur in a region.

> The more glamorous of the two is concerned with attracting new industries to an area or stimulating expansion of existing businesses. Economic development of the second type is more typical. The goal in this scenario is to foster a climate where companies will add new product lines periodically, gradually increase production and sales, add a few new people annually, and occasionally build extensions to their existing buildings. (Kopecek, 1991, p. 41)

Katsinas and Lacey (1989) distinguish between traditional and non-traditional economic development community college initiatives: Traditional initiatives are the vocational and academic curricula normally offered at community colleges, while non-traditional initiatives are of a more directive nature, typically directed more at business and economic needs. In essence, what differentiates non-traditional economic development from traditional vocational education programs is that the reach of community colleges in economic development extends outside the institution to assist communities in assessing strengths and weaknesses and to assist in rearranging various pieces to produce a stronger economic base (Katsinas and Lacey, 1990).

Vocational Education

Traditionally, community colleges have contributed most to economic development through vocational education (Bogart, 1994; Katsinas and Miller, 1998). Community colleges offer programs that prepare students to enter technical professions, supplying trained workers to business and industry (Cohen and Brawer, 1996) through vocational programs that meet the unique needs of the local region (McNutt, 1995). Core programs offered throughout the country to prepare individuals to enter the changing job market promote economic development. Vocational education and economic development are so closely related in community colleges that it is difficult to separate the two (Bogart, 1994). Vocational education is the foundation of workforce training and economic development programs in community colleges.

Continuing Education

Continuing education plays a key role in community colleges' economic development efforts. Colleges' continuing education divisions have been and continue to be the primary contact with non-traditional constituencies (Ferro, 1993). They enjoy the most extensive relationship with business and industry. Through pre-employment services, customized workforce training, small business development, and employer retention programs, they are actively involved in improving local and regional economic conditions where they operate (Ferro, 1993; Zeiss, 1994). As the mission of the community college responds to the needs of economic development, continuing

education is increasingly moving to the forefront of economic development programs and services.

Contemporary and Emerging Economic Development Activities

Community colleges have developed diverse programs and services to facilitate economic growth. More than 90 percent of community colleges include economic development in their mission statements (Rosenfeld, 1995). Boone and Gillett-Karam (1996) identified 18 strategies a community college can use to promote economic development:

1. Serve as a catalyst and leader in organizing a master plan for economic development needs in its service region.
2. Maintain an advanced technology center geared to demonstrate new technological equipment to businesses in the service region.
3. Maintain a small center that provides assistance to businesses.
4. Maintain an economic development office to coordinate all economic development services at two-year institutions.
5. Employ economic development recruiters to provide economic development assistance to local businesses.
6. Maintain a business incubator program.
7. Form partnerships with local businesses and government agencies in the service region.

8. Use partnerships to recruit new businesses actively.
9. Provide supplemental educational training for employees in new and expanding industries.
10. Use advisory committees to maintain the linkage between businesses and the community college.
11. Provide cooperative education opportunities for students in conjunction with business and industry.
12. Give faculty the opportunity to upgrade their occupational skills through a back-to-industry program.
13. Provide college placement services for graduates seeking employment in the workforce.
14. Participate in the economic development programs of local Chambers of Commerce.
15. Participate in county commissioners' economic development programs.
16. Provide job-training programs to existing businesses and industries.
17. Provide retraining programs to displaced workers.
18. Offer business-related seminars and workshops on request to industries and government organizations in the service region. (p. 20)

From their inception, community colleges have been involved in workforce training (Eells, 1931; Koos, 1925). A well-educated and trained workforce is critical to the United States' ability to compete in the global economy (Levin, 1999). Zeiss (2000)

contends that the lack of a skilled and trained workforce is the most pressing threat to communities. As a result, community colleges continue to expand services and programs to support workforce training. Workforce training or development is the centerpiece of community college efforts to promote economic development (Forde, 2002; Young, 1997; Zeiss and Barber, 1997).

Community colleges are uniquely positioned to provide workforce development programs and services. In fact, they are the only provider that offers both vocational education and workforce development programs as a bridge between educational and training programs (Grubb, 1999).

Impetus of Workforce Programs

Federal and state legislation to promote workforce development has been an important goal of workforce development programs. The Workforce Investment Acts of 1998 and 2000 give community colleges an important role in workforce development as trainers of adults who want to improve their employment and economic status (Jacobs, 2001). States have also enacted legislation that involves community colleges in workforce development as leaders in the effort to stimulate economic growth (Grubb, 1999). Wisner, Zeiss, and Barber (1997) give the following reasons why community colleges should have a significant role in workforce development:

- Community colleges have a long history of providing vocational programs that reflect the needs of their local communities.

- Community colleges have a close working relationship with local constituents, including business and industry.
- Community colleges already provide a variety of programs where the need for worker training is the greatest.
- Community colleges have considerable successful experience in services and programs for adults.
- Community colleges have developed alternate delivery systems well positioned to serve adult learners.
- Community colleges have invested heavily in support services.
- Community colleges are located within commuting distance of 90% of the population.
- Community colleges offer a variety of services and programs designed to train the workforce, including:
    - Credit/degree granting vocational programs
    - Adult apprenticeship programs
    - Work-related classes
    - Professional development programs
    - Small business development centers
    - Tech-prep programs
    - School-to-work transition programs
    - Workplace literacy programs

- Cooperative education (as cited in Quinley, 1997, p. 9)

Contract Training

An important component of workforce development is contract training, which, along with small business incubation and local economic planning, is a key component in the new economic development role of community colleges (Dougherty and Bakia, 1999). Contract training is provided based on a contract with an employer that defines the objectives of the training, schedules its duration, specifies the method of delivery, and determines the trainer's competencies (Quinley, 1997). Ninety percent of community colleges in the United States offer contract training, usually the most pervasive form of workforce development programs offered (Dougherty and Bakia, 1999).

Entrepreneurship

An important aspect of the role of community colleges in economic development is assisting small businesses by encouraging and promoting entrepreneurship, usually through establishing small business development centers and business incubators (Dougherty and Bakia, 1999). Small business development centers offer advice and consultation on cultivating new businesses and expanding existing firms. Business incubators provide a variety of services to promote the creation of small businesses. The services include low cost office space, accounting/tax assistance, and advice in financial management and marketing (Dougherty and Bakia, 1999). According to Hernandez-

Gantes, Sorensen, and Nieri, (1995) business incubation activities are among community colleges' most comprehensive strategies to promote entrepreneurship, create jobs, and stimulate economic and community development.

Economic Planning

Local economic planning is the most recent focus of the expanding economic role of community colleges. Local economic planning enlists a variety of efforts:

- scanning the social environment for developing trends of interest to employers, government agencies, civic groups, and the general public;
- working actively to create or shape a locality's response to economic and social trends;
- joining local economic policy-making organizations to attract employers;
- lobbying local, state and federal governments in favor of certain economic policies. (Dougherty and Bakia, 1999, p. 2)

Community colleges are uniquely positioned to assist communities in economic planning (Rosenfeld and Listen, 2000). An important aspect of planning economic development strategies is examining and understanding the views of residents. Ilvento (2000) found that many people in rural areas were cautious about economic development. Many did not want their way of life to change but also recognized the need for growth. Community colleges involved in economic planning must develop programs and services that the people they serve support.

Environmental scanning is an important aspect of community colleges' role in local economic planning. To be effective in promoting economic development, community colleges must assess themselves as well as the external environment, after which the school can develop institutional policies to respond to the assessment. Programs that have been developed and implemented must be evaluated to determine their effectiveness in meeting regional needs (Kirschenman and Lane, 2001).

Evaluating Effectiveness

Alfred (1991) claims that the evaluation of economic development programs in community colleges is usually poorly conceptualized and diffused throughout different departments. The evaluation of responsiveness to community needs is a core indicator of institutional effectiveness (Alfred, Ewell, Hodgins, and McGlenney, 1999).

To ensure they are meeting the needs of the community, community colleges must design evaluation programs to assess economic development activities. According to Alfred (1991), these programs must:

- secure institutional commitment;
- identify developmental goals and objectives;
- identify constituencies;
- select outcome indicators;
- assign data collection priorities;
- determine measurement methods and time frames;
- determine report formats and dissemination strategies. (p. 40)

Assessing economic development, as well as the effectiveness of the programs developed, is critical to meeting community needs. Kirschenman and Lane (2001) found

that evaluating economic development efforts not only provides the opportunity to improve future activities but also has a positive impact on program credibility and legitimacy.

Three functions of the contemporary community college—workforce development, economic development, and community development—continue to gain prominence, creating what Grubb *et al.* (1997) term the entrepreneurial community college, a college within the college focused on programs and services in workforce development and promoting economic and community development. The same source describes the entrepreneurial college as market-driven, responsive to external organizations, and supportive of entrepreneurship. The entrepreneurial orientation is in potential conflict with the traditional functions of community colleges, emphasizing academic and transfer programs less and workforce training and meeting business and industry needs more (Grubb et al. 1997). In a study of faculty perceptions of the expanding mission of community colleges, Brewer (1998), found that faculty see entrepreneurial colleges as a diversion from the collegiate functions and do not support the change of focus. Others see entrepreneurial activities diverting resources from the college's traditional functions. Bailey and Averianna (1996) report, "This is a potential severe problem in a period of fiscal constraint when state and local governments are putting pressure on colleges to reduce costs of all their activities" (p. 17).

Fundamentals of Promoting Economic Development

Economic development has become a core undertaking of the contemporary community college. Wyman (1997) contends that community colleges should embrace a more comprehensive approach to economic development, namely, economic wellness. The concept focuses on the important first step of local economic planning, helping communities assess their own workforce and economic development needs. That done, community colleges can promote economic wellness by:

- focusing on long-term workforce as well as immediate training needs of employers;
- committing to long-term career development programs;
- expanding infrastructure to encourage expansion of current firms and attraction of new businesses;
- identifying and recruiting leaders and resident participants.(Wyman 1997, p. 5)

Partnerships

A key component of effective community college economic development activities is creating partnerships (Budd, 1996; Nielson, 1996; Pappas, 1993; Wyman; 1997; Young, 1997). Community colleges can establish partnerships to promote economic and community development by developing relationships with local, state, and federal governments; business and industry; K-12 education; other higher education institutions; economic development groups; and the citizens of their region. Without strategic partners, community colleges cannot create effective activities and programs. As resources diminish, partnerships are especially important in meeting community needs.

Community colleges that hope to promote economic development will effectively assess regional needs and create partnerships to achieve their objectives. Ferro (1993) found the following additional actions necessary:

- Make involvement in economic development a core institutional mission.
- Support external involvement organizationally by assigning responsibility for economic development activities to a high-level administrator.
- Support economic development activities financially.
- Encourage, recognize, and support faculty and advocate department and program involvement in economic development. (p. 29)

Program Efficiency

Successful economic development activities have evolved as a result of community colleges creating programs that emphasize efficiency and effectiveness.

> Through the customized training that community colleges began to provide, businesses were able to contract with colleges to offer the on-the-job training required to improve the skills and competencies of the employers. New business development was encouraged via small business development centers that provided incubator space, clerical assistance, and technical support. Community colleges also began to strategically connect with community stakeholders for establishing community development corporations for economic revitalization of communities. (Forde, 2002, p. 35)

W. Norton Grubb (1999) argues that the comprehensive community college is the educational institution best situated and best prepared to help low-skilled workers and generate economic development. At the same time, he recognizes the serious challenges community colleges that want to embrace that mission face. Based on fieldwork, Grubb (1999) identifies five characteristics of colleges with successful work-related education and training programs.

- They understand the local labor market and target jobs with relatively high earnings, strong employment growth, and opportunities for advancement.
- They contain an appropriate mix of academic education, occupational skills, and work-based learning, integrated to the extent possible.
- They provide a variety of supportive services appropriate for the diverse needs of different low-skill and low-wage workers and job seekers.
- They provide students with pathways or "ladders" to further education opportunities.
- They collect information about program results and use that data to improve program quality. (p. 11)

Successful community college programs directed at promoting economic growth usually reveal interconnectedness of workforce development, economic development, and community development. Community colleges play a key role in economic and workforce development in the United States (Forde, 2002), and their involvement is likely to grow. Economic development activities are driving community colleges toward increased comprehensiveness (Bailey, 2000). Local, state, and federal governments support the increased focus on promoting economic development, as do the citizens of the colleges they serve (Levin, 2001).

Dougherty and Bakia (1999) say the new economic development role of community colleges includes contract training, small business assistance, and economic planning. Workforce development, of which contract training is a component, will likely remain the paramount economic development activity. Templin (2002) stresses the critical role community colleges play in preparing workers for emerging technological fields and suggests the following steps to prevent a workforce shortage.

- Facilitate the development of an industry-driven workforce development strategy.

- Create a national network of community-based training and workforce centers.
- Team with community-based organizations to develop a training pipeline for a technology-based economy. (p. 9)

The research related to economic development indicates that community colleges are important drivers of economic growth. Creating and maintaining strategic partnerships is critical to institutional promotion of economic development. Subsequently, colleges that embrace the new mission of workforce training seek to meet rapidly changing local economic needs. Community colleges, through both traditional and emerging activities designed to promote economic development, should continue to expand programs and services to meet the needs of their local communities.

Overview of Community Colleges

Community colleges were designed in the early 1920s with an early objective—to educate technologists with both theoretical knowledge and manual skills—and are recognized as an important resource for American economic competitiveness.

> On this, I am convinced, rests both the still huge productivity advantage of the American economy and the so far unique American ability to create, almost overnight, new and different industries. Nothing quite like the American community college exists anywhere else so far. The famous Japanese school system produces either people prepared only for manual work or people prepared only for knowledge work.…But these other developed countries should be expected to catch up with the United States fairly fast. (Drucker, 1999, pp. 151-152)

During the last two decades, the role of community colleges in economic development has changed. Many community colleges, for example, have broadened and

diversified to add a range of new activities in workforce development and development focused on customized, industry-specific training (Day, 1997; Dougherty and Bakia, 1999; Roueche et al., 1995).

The changing role is taking community colleges in a new direction, "from an institution focused on training students to one that is centered on meeting the needs of business and the economy" (Dougherty and Bakia, 1999, p. 1).

> The new role for community colleges is to develop partnership opportunities with external entities.…The economic development arena offers perhaps the quickest and possibly the most significant opportunities for collaboration with business and industry. (Roueche et al., 1995, p. 230)

Community colleges are one of several public-sector providers of customized industry-specific training. While the literature rarely mentions them, several other forms of career and technical education institutions are prominent players in workforce development and economic development, specifically in customized industry-specific training. They include, but are not limited to, vocational education institutions, technical institutes, technical colleges, poly-technical colleges, and four-year colleges and universities.

Evolution of Workforce Education

Over the last 20 years, business leaders, educators, and policymakers have devoted substantial time and effort to issues of workforce education and readiness in an era of rapidly emerging technology, global competition, and a redefined workplace. Many question the ability of the American worker to compete in the new environment,

and certain government reports explicitly articulate perceived and actual shortcomings in the workforce. The authors of *A Nation at Risk* (The National Commission on Excellence in Education, 1983), *The Forgotten Half* (Commission on Work, Family and Citizenship, W. T. Grant Foundation, 1988), and *America's Choice: High Skills or Low Wages?* (Commission on the Study of the American Workforce, 1990) conclude that the educational system and the workforce it produces are not up to the challenges created by the new business environment. The report of the Secretary's Commission an Achieving Necessary Skills (U. S. Department of Labor, 1991) identifies an aging workforce, lack of technical knowledge, and an overall lack of workplace readiness among problems.

In response, America's community colleges have been given and have accepted a key role in workforce education. Kazis (1994) expresses an early response to the challenge of workforce education.

> It is no surprise…that the two-year college is seen by many as the most appropriate institution for the delivery of the technical skill training in this country and, therefore, as the logical post secondary partner…linking school to work. (p.3)

As cited in the introduction to his study, Day (1997), writing for the Commission on Workforce and Community Development of the American Association of Community Colleges, suggests that community colleges are not *a* key provider but rather *the* primary provider of lifelong workforce training. His rationale is compelling.

- The nation's 1,300 community colleges are strategically located so that 95 % of the population is within twenty-five miles of a community college.
- A majority of first-year college freshmen, minority students, and women, are enrolled in community colleges.

- Of business surveyed, 80% were familiar with or had used community college services.
- Businesses perceived community college workforce education as cost-effective, of high quality, and available in a desirable location. (p. 50)

According to Day (1997), no other type of institution offers the expertise, location, and reputation that community colleges do. Griffith and Conner (1994) emphasize the importance of community colleges to workforce development even more.

> The point is that perhaps never before in their half century or so of existence have the community colleges of America been so well positioned to play a major role in America's future. If we as a nation decide that "high skills" is our route to the future, there is no better institution than the community college system to address the massive education effort this will require. (p.80)

The Validation of Community Colleges

Numerous reasons make community colleges the vendor of choice for workforce education, especially when compared to the competition. Community colleges may compete with public and private post-secondary vocational schools, four-year colleges, equipment makers, consultants, private training services, unions, and professional organizations, yet they usually come out ahead as workforce education contractors (Dougherty and Bakia, 2000). What makes community colleges so attractive to employers? Lower costs.

Employers choose local community colleges to provide workforce education because they cost less. Zeiss *et al*. (1997) surveyed approximately 2,500 employers who had done business with a community college. When asked why they selected the

community college, 68% checked “cost effective value for money invested” (p. 45-46). Zeiss cites a number of factors that contribute to the unique competitive position community colleges enjoy when cost is considered. Classrooms and labs originally built for traditional education often make excellent facilities for workforce education during otherwise idle hours. Built with public money, the facilities often are of world-class quality and highly desirable to employers. In what amounts to indirect government subsidy of corporate training, colleges have become adept at leveraging their physical plant to keep costs low and quality high.

Recruiting faculty specifically for teaching in workforce education programs at lower pay also lowers the cost of training. Zeiss (1997), as cited in Dougherty and Bakia (2000), reports that trainers and part-time faculty are willing to work for less money because the experience gives them greater credibility and more exposure.

Direct government subsidy of workforce education through grants and contracts that come under the guise of economic development are critical to keeping costs low. Many states, Michigan among them, offer substantial grants to employers who partner with community colleges for workforce education and training. The subsidy, under programs that Grubb (1997) calls “categorical funding,” provides colleges with direct or competitive grants specifically to address employers’ workforce education needs. Typically, categorical funds come with strong regulations attached, so colleges use them only for education and training that meet the greater good of society, in contrast to what Grubb calls mere public subsidy to private employers with little regulation. Workforce

education resources come, then, from a combination of regular state community college funding, categorical funding, local tax revenue, employer payments for tuition or contracted services, and occasionally student tuition.

Summary

Community colleges have evolved as critical institutions of innovation to keep America's workforce informed and trained in technological advances through non-credit and customized workforce development education programs. Currently, community colleges enroll over 10.5 million students—half non-credit students—in 1,132 public and private college campuses nationwide (American Association of Community Colleges, 1999a). As Dougherty (2001) notes, "Community colleges play an absolutely crucial role in the total system of workforce preparation.…Community colleges train, not just workers—whether prospective or current—but also managers, supervisors, and company owners" (p. 129). The evolution of community colleges is constant and dynamic.

The Mission of Community Colleges in Economic Development

The mission statements of community colleges throughout the United States reveal a variety of interrelated and overlapping ideas to define their scope of work. Every college is a complex network of organizational capabilities defined by the composition and needs of its community and the basic philosophy in state and local master educational plans. The common thread is a persistent emphasis on teaching and student learning

rather than research or publishing in academic disciplines (Grubb, 1999). Within the basic mission of teaching and student learning, several sub-categories of the community college's role are common: (1) academic preparation, either for transfer to four-year institutions or for the completion of associate degrees; (2) remedial instruction for native-born students whose previous academic record does not position them for postsecondary instruction; (3) English language development or other kinds of learning designed primarily for foreign-born students; (4) job training; (5) occupational education and training leading to certification, credentialing, or licensing; (6) worker-initiated short-term training; and (7) customized education and training for employers (Carnevale and Desrochers, 2001). In a study exploring the broadening mission of community colleges, Rosenfeld (1995) found that 90% of community colleges surveyed included economic development or modernization services in their mission statement.

The amplification of the community college mission is a debated topic. Until recently, the debate included those who favored a focus on transfer and academic programs (Brint and Karabell, 1989; Cohen and Brawer, 1996; Eaton 1994) and those who preferred a vocational emphasis (Grubb, 1999; Clowes and Levin, 1989). Though the debate continues, it has shifted. Community colleges currently emphasize and fund non-credit/credit continuing education courses, a noticeable shift away from degree programs (Brewer, 1998).

> The mission of the community college has less emphasis on education and more on training, less emphasis upon community social needs and more on the economic needs of business and industry, less upon individual

> development and more upon workforce preparation and retraining. (Levin 1999, p. 2)

The concept of economic development as a mission for community colleges is difficult to understand, primarily because neither policy makers nor colleges themselves agree on the definition of the term. Economic development, workforce development, and community development are three areas where community colleges find roles for themselves, but none is clearly defined in practice. Generally, community colleges see economic development as an active role to stabilize or increase employment for its graduates and to improve the effectiveness or competitiveness of community employers as potential employers of its graduates (Grubb, Badway, Bell, Bragg, and Russman, 1997).

The new perception of their role impels community colleges to various kinds of action, including organizing industry sector advisory groups to determine training needs, transferring technology from industry to community college curricula or from community colleges back to local employers, fostering local business leadership, and institutional scanning of industry and business opportunities and technologies to keep both colleges and businesses abreast of changes and trends. In some cases, colleges help attract employers to communities by building local work force capacity to meet the demands of businesses seeking new locations. The common goal is to enhance productivity and employment in the area. Other activities include convening meetings, gathering and disseminating information, helping with technology transfer, and carrying out economic research and planning. Such activities do not usually result in conventional course

enrollments and must be measured differently. A school's involvement in economic development depends in large part on its reputation as a standard college, because unless that reputation is good, the community is not likely to involve it in economic development (Grubb *et al*., 1997).

In most colleges, the overlap between workforce development, community development, and economic development activities is great; in fact, schools often see that overlap can benefit the college substantially, growing and developing the enrollment base and strengthening advancement efforts (Grubb *et al.*, 1997).

Cantor (1991) argues that over 85% of community colleges promote their economic development activities and a third have incorporated economic development into their mission statements. Katsinas and Lacey (1989) contend that community colleges have been involved in economic development in their service areas since they began. Dougherty and Bakia (1999) argue, however, that community colleges see their role in economic development as secondary to program and course development.

Community colleges have a rich tradition of serving their areas with vocational and technical training. They have assisted the business community indirectly by preparing students for employment, yet only recently have they begun to incorporate "economic development" in their mission statements.

Since the mid-1970s, community colleges have expanded their mission statements to include economic development, and the business community has become a major constituency (Cantor, 1991). College leaders work with business and community leaders

to attract new firms to their regions, assist existing businesses, and provide technological information about new production methods and equipment (Palmer, 1990). Providing a skilled workforce for the employers in the communities they serve has always been a mission of community colleges and technical institutes (Cohen and Brawer, 1996). Business and industry support vocational education and believe it deals with social problems like unemployment, slow economic growth, and competitive pressure (Grubb and Stern, 1989) by bringing specifically skilled people into the workforce.

North Carolina was the first state to combine vocational education and economic development in its community college system (Grubb and Stern, 1989). Following North Carolina's lead, most southern states provide specialized training as a part of their strategy to recruit new industry. All southern states have a strong network of community and technical colleges (Rosenfield, 1992). During the 1980s, legislators in most states funded economic development related job training programs, and many state systems emphasize customized training (Grubb and Stern, 1989). The American Association of Community Colleges (1999) reports that:

> [E]conomic development broadly encompasses workforce education and training, funding and delivery issues, occupational skill standards, community-based programming, basic skills, restructuring issues, economic impact (ROI) studies, welfare initiatives, occupational programs, school-to-work, tech prep, corporate institutions, licensure, international development, literacy, lifelong learning, one-stop career centers, and customized training. (http://199.75.76.25/initiatives/issues/focusareas/economic.htm)

These strategies go far beyond the traditional vocational and technical classroom, yet community college leaders find themselves committing resources to some, if not all of them.

Community colleges involved in local economic development go beyond the traditional junior college model and undertake work typically done by city or state planning commissions (Dougherty and Bakia, 1999), taking up slack as federal funding for economic development declines (Eisinger, 1988). Although there has been some conflicting views regarding the role of community colleges in the business of economic development, community colleges, however, must not only commit themselves to economic development: they must make it happen (Mundhenk, 1986).

The Nexus of Workforce, Economic Development, and the College

The availability and maintenance of a skilled, educated workforce will be crucial not only to the success of American businesses and industries in the twenty-first century but to the long-term employability of American workers (Salzman, Moss and Tilly, 1998: U.S. Department of Labor, 1999). According to the U. S Department of Labor (2000b), the present and future health of America depends wholly on how well its workforce "reaches a new level of literacy—'21st Century Literacy'—that includes strong academic skills, thinking, reasoning, teamwork skills, and proficiency in using technology" (p. 5). Failure to respond to America's workforce needs will damage America's economic status and ability to compete globally (Salzman *et al*., 1998). Who better to respond and meet

the changing needs than our nation's community colleges? Community colleges are the nexus for American workforce development now and into the future (McCabe, 1997).

Our national workforce's capacity and skill "have always been a, if not the, critical factor" in determining the country's "economic growth and vitality" (Rosenfeld, 2000, p. *v*). "Where these abilities are in short supply, economic growth is constrained and negatively affected" (Rosenfeld, 2000, p. *v*). Federal Reserve Board Chair Alan Greenspan says, "The future economic prosperity of the nation in large part depends on the ability of colleges and universities to continue to…educate American workers" (American Council on Education. 1999, p. I). What is the function of community colleges in fostering economic success among people, businesses, communities, and states? We must understand that role. Workforce initiatives are the key and demonstrate how college workforce programs encourage economic development in their areas.

Workforce Development

Education is critical to the economic well being of individual people and the nation as a whole (Newburger and Curry. 2000). Community college researchers and educators know that education affects individual earning potential (Sanchez and Laanan. 1998). Simply stated, the more education and training, the higher the earning potential or economic return (Frazis and Loewenstein. 1999; Smith, 1995). Grubb (1996) says that while people with baccalaureate degrees and associate degrees are more likely to land better paid managerial or professional jobs, people post-secondary workforce education

at a community college or other educational institution are apt to "move from the bottom levels of the labor force into mid-skilled positions" (p. 87).

According to Watkins (1995), "formal education accounts for a 15% variation in lifetime earnings while workplace training accounts for an 85% variation in lifetime earnings" (p. 9). The variance in earnings is attributable to a highly technical and knowledge-based economy; the life cycle or obsolescence of knowledge is increasingly shorter, less than four years on average (Swanson and Torraco, 1995). Some estimate that over the next decade, 75% or more of America's workforce will require significant job training or retraining in communication, computation, and computer technology (Day, 1996). If American workers expect to stay marketable and earn more, life-long workforce training will be the norm rather than the exception (Quinley and Hickman, 1997).

Business and industry, too, gain by using workforce training to increase their employees' skills and educational level. Employers who raise educational level requirements by 10% realize an increase in manufacturing productivity of 4.9% to 8.5% and between 5.9% and 12.7% in non-manufacturing productivity (Black and Lynch, 1996). Writing of the impact of training on productivity, Black and Lynch (1996) report that "for manufacturing, the greater the proportion of time spent in off-the-job training, the higher the productivity.…For non-manufacturing, the content of the training programs…seems to have an important impact on productivity" (p. 265). Employers who invest in education and training earn far more than the marginal 3.4% increase in

productivity that comes from a 10% increase in expenditures for additional capital equipment items, like tools, building, and machinery (Smith. 1995).

Recruiting New Industry

Community colleges play a critical role in economic development, not only by maintaining a fine-tuned workforce for local businesses but also by attracting new business and industry (Dougherty and Bakia, 1999; Lancaster, 1999; Schmidt, 1997). The educational training services community colleges provide enables existing and emerging businesses and industries to adapt successfully to variable economic conditions spurred by market demand, market competition, technology, and the availability of a skilled workforce (Powers, Powers, Betz, and Aslanian, 1988). In a recent national survey of community colleges, researchers found that 66% of the responding institutions were involved in local economic development councils (Katsinas, Bliss, and Short, 1995). About attracting new businesses, a community college director of workforce development said, “We scan the environment vigilantly.…Knowing company relocation plans well ahead of time can make the difference between being prepared to train new employees and losing out altogether” (Zeiss, 1998, p. 67). Among four-year universities, private colleges and universities, and proprietor institutions, state legislators think community colleges are most responsive to state and community educational training needs (Ruppert, 2001). The legislators note that the community college sector's “willingness to develop new programs or make curricular changes that are in tune with

the needs of business and industry" (Ruppert, 2001, p. 13) raises their stake in state educational systems. Legislators identify the following economic-related roles to be played by community colleges and other institutions of higher learning (Ruppert, 2001):

1. Strengthen and diversify the economy by attracting business growth and development by generating new ideas and providing the latest technology.
2. Prepare and train a high-skill, high-wage workforce to attract new businesses and serve their needs.
3. Raise the educational level of the state's population to foster economic, social, and civic benefits for both states and citizens. (pp.7-9)

Small Business Procurement

Recently community colleges have begun assisting and incubating small businesses (Dougherty and Bakia, 1999). Small business assistance involves consulting and educating small business owners and managers in business management, personnel, marketing, finance, production operations, contracting, and related government regulations (Grubb, Badway, Bell, Bragg, and Russman. 1997). The primary delivery modes of small business assistance are:

- Small Business Development Centers (SBDC). Established by federal legislation (PL 86-302 in 1980 and amended by PL 98-395 in 1984), they receive federal and state financial assistance via competitive grants to community colleges (Carmichael, 1991).
- Technology Centers. Established by state and federal grant initiatives, they help manufacturers become familiar with the latest robotic, microelectronic, manufacturing, and computer-assisted design technologies (Kent, 1991, p.31).

On the other hand, small business incubation involves business consulting services, along with inexpensive office space and administrative support for the first few months or years of a new business' life (Hernandez-Gantes, Sorensen, and Nieri, 1996).

Of approximately 500 small business incubators nationwide, community colleges sponsor only 76 (Dougherty and Bakia, 1999). The collective impact of business assistance and incubation are significant to local and state economies in terms of increased business growth and retention, increased business financial stability, lower business failure rates, increased employment opportunities, and increased local, state, and federal tax revenues (Rivera, 2002).

Conclusion

Who does America's workforce turn to meet its training needs? With 96% of all community colleges offering workforce education programs, America's workforce most often (75% of the time) turns to them (Doucette, 1993; Phillippe and Patton, 2000; Zeiss, 1998). In turn, 95% of employers and businesses that use community colleges recommend them for workforce training (Zeiss, 1998). Why? According to research (Hickman and Quinley, 1997; Phillippe and Patton, 2000; Quinley, 1996; Zeiss, 1998), employers choose community colleges for the following reasons:

1. **Cost effectiveness**: Sixty-eight percent of businesses and organizations that go to community colleges for workforce training list cost as the primary criterion. Community colleges are far less costly than private training vendors, due to state funding support for workforce development.
2. **Customized programs**: Approximately 55% of employers choose community colleges for their ability to develop and customize a workforce training

program based on employer needs. Employers who use community college workforce training say their top goals are improving employee performance, upgrading employee skills, professional development enrichment, and mandatory continuing education.

3. **Quality of instruction**: More than 50% of employers say that workforce education instructors are qualified, knowledgeable, committed, and responsive to students' needs, as well as skilled at motivation and team building to enhance student learning.
4. **Administrative staff**: Ten percent of employers see community college staff as responsive, flexible, dependable, experienced, knowledgeable professionals. Good day-to-day working relations between employers and colleges are critical to the success of workforce education programs.

Employer perceptions of community college workforce education programs reveal high levels of satisfaction (Rivera, 2002). If America's workforce is to compete successfully in the global market environment, community colleges will have to partner with business and industry and local, state, and federal governments to rebuild American competence (Johnstone, 1994). American community colleges are well positioned to become the pre-eminent delivery system of workforce (Quinley, 1996). "Education has many benefits for the individual…But it has a greater value for the society, as education is an investment in the future" (Smith, 1995. p. 51).

Since workforce development is requisite to successful community economic development, this study hopes to illuminate the issue and its significance. Jones (1996) states that communities profit when community colleges offer workforce development education: (1) people earn 9% more annually for each year of schooling beyond high school; (2) companies enjoy an 8.6% increase in productivity if they raise the educational level of their workforce by one year; and (3) state and local governments with more educated workforces see higher economic growth and development rates than states with less educated workforces. Clearly, the education of America's workforce affects the economic well being and success of people, businesses, communities, and the nation (Newburger and Curry, 2000).

The Alamo Community College District

The Alamo Community College District (ACCD) was born with the 1898 founding of St Philip's College by Bishop James Steptoe Johnston of the Diocese of West Texas of the Episcopal Church. The school opened on March 1, 1896, as a sewing class for high school girls, with fewer than 20 students attending classes in a house in the area known today as La Villita in downtown San Antonio. Following the passage of state legislation authorizing junior college districts, the San Antonio Union Junior College District was formed in 1945, and in 1946 assumed control of San Antonio College and its sister college, St. Philip's Junior College. The district's name was changed to San

Antonio Community College District in 1978 and in 1982 to the Alamo Community College District.

San Antonio College

San Antonio College was established as University Junior College in September 1925 under the auspices of the University of Texas. The following year, control of the college was transferred to the San Antonio Independent School District and the name changed to San Antonio Junior College. In 1948, San Antonio Junior College became San Antonio College and in 1951 moved to its present location on San Pedro Avenue with 500 students enrolled. In 1955, the Southern Association of Colleges and Schools accredited the college. In the late 1960s, San Antonio College expanded its offerings in occupational and technical courses and took over the San Antonio Independent School District's continuing education program to become a comprehensive community college. Today, San Antonio College is one of the country's largest single campus community colleges and the largest single campus college in Texas, enrolling approximately 22,000 students. The college has an inviting campus with a renovated student center and new mall with brick sidewalks, a fountain, and dozens of tables and chairs for students to congregate, all surrounded by superb landscaping and a student friendly environment.

St. Philip's College

St. Philip's College was founded on March 1, 1898 to educate and train recently emancipated slaves in the post-Civil War era, rapidly expanded its mission and to become a vital resource in the local African-American community. From 1898 to 1900, a missionary of the Episcopal Church directed instruction at St. Philip's. In 1942 the college affiliated with San Antonio College and the San Antonio Independent School District, marking the end of the college's life as a private institution. In 1917 St. Philip's College moved from its original site to a location just east of downtown and grew again in 1987 when Southwest Campus, formerly part of East Kelly Air Force Base, was designated an official campus of St. Philip's College. That campus, which operated as an Alamo Community College District extension from 1975 on, today serves students, business, and industry as a technical training hub. A multi-million dollar capital expansion in the early 1990's added four important new buildings to St. Philip's College. Other expansions include opening the Northeast Learning Center in 1996 and completing the Learning and Leadership Development Center in 1997. The Northeast Campus on Pat Booker Road is the newest addition to St. Philip's College and San Antonio College.

Palo Alto College

Palo Alto College was established by the Alamo Community College District's Board of Trustees on February 21, 1983, and chartered by the Texas Legislature on March 19, 1983, as an open-admission, two-year public college. Classes opened in

September 1985 with 231 students enrolled. The opening of the college made the community's vision of establishing an institution of higher learning on San Antonio's underserved South Side a reality. For two years, the college's administrative offices were near Kelly Air Force Base at Billy Mitchell Village. Classes met initially at various locations, including the Southwest Center of the Alamo Community College District, high schools, and military bases, until the campus opened in January 1987. A two-story general education classroom building in 1991, a natatorium/gymnasium complex in 1992, the learning resources center in 1997, and the Ray Ellison Family Center in 2001 joined the original eleven buildings.

Northwest Vista College

Northwest Vista College has grown rapidly from 12 students in fall 1995 to more than 7,200 students in spring 2003, exceeding the college's master plan projection of 5,000 students by fall 2002. Northwest Vista College is a leader in fostering and nurturing business and community partnerships. For the past nine years, the college has worked collaboratively with the World Savings and Loan Association, which donated 112 acres for the ACCD center to address community business needs and promote various partnerships. ACCD operates three categories of partnerships: customized training contracts, facilitation of workforce grants, and technical advisory committees. The center's programs, such as the Cisco Systems Networking Academy, continuing education courses, and specialized computer software training, help people changing

careers or re-entering the workforce. Northwest Vista adapts to the changing marketplace by offering programs in growing fields and refining them periodically. Special advisory committees made up of industry leaders oversee the programs and recommend changes. Most recently degree plans in biotechnology and information security and assurance were created in response to projected needs in Bexar County. The college offers two-year associate degrees and certificates in ten fields: biotechnology, Braille textbook transcriber, community health, computer programming, computer support, customer service, multimedia technology, network administrator, pharmacy technology, and information security and assurance.

ACT Business Assistance Center

In May 2002, ACCD celebrated the opening of the ACT Business Assistance Center, which offers people and businesses throughout the area more than 1,500 web-based courses, affordable educational and training service programs for adult literacy, and professional development. The college also maintains a partnership with Northside Independent School District, which offered Northwest Vista its classroom facilities before the college was built. In 1996, the college began participating in a dual credit program with Northside ISD, which lets eligible high school students earn college credit for certain courses and currently enrolls over 1,200 students. In 2001, the Department of Education awarded Northwest Vista College a $1.9 million Title V Grant, housed under

the Hispanic-Serving Institutions Program, to expand innovation in comprehensive academic foundations, learning assessment programs, and E-learning communications.

Response to Workforce Growth

The Alamo Community College District is ideally positioned to meet the San Antonio region's education and training needs and the exigencies of the new Toyota truck assembly plant. ACCD's colleges are accredited by the Southern Association of Colleges and Schools and offer a comprehensive post-secondary curriculum of academic, professional, and technical programs leading to associates degrees and certificates of completion. Together the colleges engage over 5,400 students in manufacturing and related program specialties, such as manufacturing engineering technology, CNC operators, plastics, robotics, logistics management, lathe, and mill operations. In addition, the ACCD Advanced Technology Center offers courses in CAD-CAM, computer integrated manufacturing, ISO9000 and ISO 14000, lean manufacturing, quality management, and statistical process control.

The ACCD colleges recognize that higher education institutions must work together to create partnerships and articulate agreements to meet the needs of the community better. Numerous 2+2 Articulation agreements are already in place between ACCD, the University of Texas-San Antonio, Texas A&M University-Kingsville, Texas Tech University, and Texas State University. Through various partnerships, ACCD has generated almost $30.5 million in federal grants (ACCD 2003). Appendix A illustrates

the diverse student population profile. With its flexible workforce programs, the Alamo Community College District is positioned ideally to meet the education and training needs of San Antonio's industry recruitment efforts and the future Toyota Assembly plant.

Team Toyota Project

The Toyota truck assembly plant signaled achievement for San Antonio. On February 5, 2003, Toyota Corporation announced that it had chosen a 2000-acre site in San Antonio to build its sixth North American vehicle assembly plant. Toyota Motor Manufacturing, Texas, Inc., will build approximately 150,000 Tundra trucks annually, beginning in 2006. Production at the San Antonio plant will supplement Tundra production at Toyota Motor Manufacturing, Indiana, Inc., (TMMI), which currently manufactures the model exclusively. The new plant is an $800 million investment by Toyota and is expected to bring approximately 2,000 new jobs to San Antonio and create work for many more indirectly. Operations at the plant will include stamping, body welding, plastics, painting, and assembly.

"This is the most significant economic development in this region by the private sector in history," said Bexar County Judge Nelson Wolff. "I think you will be able to say that this will transform our economy, and lead to a higher wages and a better standard of living for people in San Antonio."

Chapter Conclusion and Summary

Technology, globalization, and shifting demographics make information and knowledge the new currency. Companies that develop educated and skilled workforces have a competitive advantage in the global marketplace. Human capital development, therefore, has become increasingly important to individual and corporate success. The current shortage of technology workers and "knowledge workers" exemplifies how economic changes affect the labor market.

Historically, higher education has played an important role in developing the labor force within the traditional missions of teaching, research, and service. Community colleges again are well positioned to support the business sector's increasing need for training and development services. Community colleges have demonstrated that workforce development partnerships are productive and beneficial to both business and higher education. This study gathered information to clarify the way colleges and universities respond to the growing demand for training and development.

Higher education is crucial to the continued growth of the American economy. Further research and analysis will assess impact of institutional involvement in economic development within the community's economic leadership groups. This study aims to identify the rationale of community college involvement in economic development and the concomitant problems.

As we enter the 21st century, community colleges are finding that two features that set them apart from other post-secondary educational institutions are workforce

development and accessibility. The combination of expertise in training adult learners, emphasis on workforce development, and making education accessible to students who are also workers defines what community colleges mean by economic development.

This review has traced the evolution and progress of the community college movement, as well as workforce education programs related to economic development in America. Community college workforce education programs are active not only in educating and preparing America's workforce for current and future challenges but also in fostering prosperity in business and industry and the public at large. In San Antonio, community college workforce education programs facilitate regional workforce development initiatives by partnering with area businesses and agencies to develop and deliver workforce related education and training, much as most community colleges do nationwide.

To be effective, workforce education programs must be responsive and proactive toward the needs of constantly shifting national and global markets. To do that, community colleges need support and input from institutional, community, business, and political constituencies (Rivera, 2002). Administrators of workforce education programs must study market and technology trends to align program offerings with demand (Rivera, 2000). Although community colleges are generally meeting the needs of America's workforce, little research is available about how community colleges promote their economic development programs to community leaders.

In addition to examining the relation and history of higher education and economic development, this study focused on the Alamo Community College District's workforce development system and its collaboration with the San Antonio business community to acquire a premier economic development project: the Toyota truck manufacturing plant.

CHAPTER THREE

METHODOLOGY AND METHODS

Overview

Chapter One established the importance of workforce development as a major component of economic development in a community and an opportunity for community colleges to take the lead in providing a skilled workforce. Chapter Two reviewed the relevant literature in both education and business and revealed business leaders' perceptions of higher education and the future of the workplace, including demographic and strategic changes in the workforce, the current mission of workforce programs in community colleges, the need for better understanding of workforce and economic development activities, the emerging role of higher education in workforce issues, and the reason to publicize ACCD's effect on economic development and it's role in attracting the Toyota plant.

Chapter Three presents the study's research design and methodology. It describes the framework of qualitative inquiry and the object of a case study. The chapter also describes the participants in the study, the instrumentation, methods of data collection and analysis, and the study's validity and reliability.

Research Design

Research design is a purposeful and systematic attempt to investigate a problem. According to Merriam (1988), research design is similar to a blueprint. "It is a plan for

assembling, organizing, and integrating information (data), and it results in a specific end product (research findings)" (p. 6). Yin (1994) calls research design "the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of a study" (p.18).

Three criteria guide the choice of research design (Merriam, 1988):

- the kind of research questions being asked;
- the research's level of control over the variables involved;
- what the researcher sees as the desired final product. (p. 48)

Yin (1994) adds a further point—the degree to which the study focuses on contemporary, as opposed to historical, events.

This study is a non-experimental case study, defined by Merriam (1988) as "an examination of a specific phenomenon such as a program, an event, a person, a process, an institution, or a social group" (p. 9). Case studies are "concerned with understanding and describing process more than behavioral outcomes" (Merriam, 1988, p. 31). The case study's strength is its capacity for managing a variety of evidence, including documents, artifacts, and interviews (Yin, 1994).

Since this study proposed to examine what Alamo Community College District does specifically to meet San Antonio's economic development needs, it needed a case study design to generate an in-depth, information-rich, description. Case studies are the preferred research tools to examine contemporary events (Yin, 1994) and appropriate for this study.

The design can also analyze and inform policy. According to Collins and Noblit (1978), case studies best captures situations and settings related to policy and offer a better assessment of social change, often the object of policy.

Further, case studies examine complex social units well (Merriam, 1988) and provide insights and expanded meanings within a holistic account to help structure future research.

Rationale for the Method

Qualitative inquiry methods help researchers study selected issues in depth and detail and contribute to basic research through "grounded theory,…an inductive strategy for generating and confirming theory that emerges from close involvement and direct contact with the empirical world" (Patton, 1990, p. 153). Interviews, observations, documents, and records ground theory (Henwood and Pigeon, 1995). In addition, "qualitative methods are necessary to capture the unique diversities and contrasts that emerge as local programs adapt to local needs and circumstances" (Patton, 1990, p.102). The ideal qualitative methods strategy has three parts: "(1) qualitative data, (2) a holistic-inductive design of naturalistic inquiry, and (3) content or case analysis" (Patton, 1990, p. 189).

Qualitative data, the first component, is "a source of well-grounded, rich descriptions and explanations of processes in identifiable local contexts" (Miles and Huberman, 1994, p. 1). Data supports a thick description of the entity studied. Thick

description “goes beyond the mere or bare reporting of an act (thin description), but describes and probes the intentions, motives, meanings, contexts, situations, and circumstances of action” (Glesne and Peshkin, 1992, p. 19). Qualitative data and descriptions are excellent means to examine workforce development within ACCD’s service area and to inform economic leaders. Gathering qualitative data takes researchers beyond their initial conceptions and generates or revises conceptual frameworks (Miles and Huberman, 1994).

The second component, the naturalistic inquiry, enhances conceptual frameworks. In the inquiry method, the “researcher's role is to gain a ‘holistic’ overview of the context of study” (Patton, 1990, p. 6). “The inductive approach to evaluation means that an understanding of program activities and outcomes emerges from experience with the setting. Theories about what is happening in a setting are grounded in direct program experience” (Patton, 1990, p. 44).

The third component, a case study, is “any descriptive or evaluative analysis of a common social unit, a local program, or an agency” (Guba and Lincoln, 1981, p. 247). Case studies provide in-depth, detailed information about programs that “cannot be fully captured and measured along standardized scales” (Patton, 1990, p. 102). That type of analysis is appropriate to gain a perspective on how ACCD maintains successful workforce development programs. The case study of ACCD provides information about the process of implementing a systemic approach to economic development and the

perceptions of the college's contribution to economic development education and business leadership encountered.

Framework of the Study

This investigation is a case study of the economic development activities of the Alamo Community College District in San Antonio. Case studies can be quantitative or qualitative or both; this study is qualitative. Yin (1994) defines a case study as an empirical inquiry that:

> [I]nvestigates a contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not clearly evident; and copes with the technically distinctive situation in which there will be many more variables of interest than data parts; and relies on multiple resources of evidence, with data needing to converge in a triangulating fashion; and benefits from the prior development of theoretical propositions to guide data collections and analysis. (p. 13)

A case study differs from other types of qualitative analysis in being an intensive description of a single unit or bounded system (Creswell, 1998). Merriam (2001) further characterizes a case study as:

- particularistic, focused on a particular situation, event program or phenomenon;
- descriptive, producing a rich, thick description;
- heuristic, expands understanding of the phenomenon under investigation. (p. 72)

The qualitative case study method selected lets the researcher collect detailed information about the economic development activities of the four campuses. Merrian (2001) says, "A case study design is employed to gain an in-depth understanding of the

situation and meaning involved.…Insights gleaned from case studies can directly influence policy, practice, and future research" (p. 19). Feagan, Drum, and Stoberg (1991) cite the following advantages of the case studies.

- They ground observations and concepts by studying people in a natural setting.
- They provide information from a variety of sources over time, generating a more holistic understanding.
- They furnish the opportunity to uncover a phenomenon's historical dimension.
- They encourage and promote the generation of new ideas and theories. (p. 38)

This case study is designed to examine how ACCD responds to regional workforce needs and to identify the successful economic development programs and activities in the four community colleges in San Antonio. Investigations involving *how* and *what* questions are exploratory and examine a set of contemporary events over which the researcher has little or no control. The case study has a distinct advantage over other types of research methods (Yin, 1994). The design of this study meets those requirements and creates the opportunity to develop a detailed description of the economic development activities of the four schools.

Case Selection

This investigation is a single case study of the Alamo Community Colleges District. A case study may involve one or several cases, so long as the phenomenon occurs in a bounded context (Creswell, 1990; Miles and Huberson, 1998). A single case is also appropriate when the investigation involves a unique situation (Yin, 1994). This

study meets both criteria. The four community colleges are a bounded system within a discrete geographical area and face similar challenges and opportunities. They are all components of the Alamo Community College District with the same educational mission and similar programs and services. They also reflect a unique set of circumstances that makes a meaningful case study possible: they all serve the San Antonio region. This case study identifies economic development activities and strategies designed to meet the unique needs of San Antonio's goal of securing employment and notably the Toyota truck plant.

Data Collection

The researcher collected and examined written information related to the economic development activities at each of the four colleges. Documents often supply supplemental information for a case study where interview are the main data source (Bogdan and Biklen, 1998). Interviews of people involved in economic development activities at each institution are the primary source of data for this study. The researcher obtained permission from the University of Texas' College of Educational Institutional Review Board, the Alamo Community College District, and the president of each school before conducting research.

Identifying Participants

The researcher used purposeful sampling to identify the persons to be interviewed. Patton (1990) defines purposeful sampling as "selecting information-rich cases whose study will illuminate the questions under study" (p. 169). Information-rich cases gave the researcher a chance to examine the research questions in depth.

Patton (1990) outlines a strategy of purposeful sampling that emphasizes identifying information-rich participants. Chain sampling involves asking well-informed people to direct the researcher to others who can provide additional valuable information. The researcher used chain sampling by asking each college president to identify people on each campus who could provide information.

The following people were interviewed as *interior sources*:

- Dr. Terence Kelly, Chancellor, Alamo Community College District
- Dr. Federico Zaragoza, Vice Chancellor, Professional, Technical, and Workforce Education
- Dr. Angie Runnels, President, St. Philip's College
- Dr. Cha Guzman, President, Palo Alto College
- Dr. Jacqueline Claunch, President, Northwest Vista College
- Dr. Robert Ziegler, President, San Antonio College

The following were interviewed as *exterior sources*:

- Diane Rath, Chair and Commissioner, Texas Workforce Commission

- Judge Mosley, Executive Director, Texas Department of Economic Development
- Ed Garza, Mayor, City of San Antonio
- Dr. Randy Goldsmith, Executive Director, San Antonio Technology Accelerator Initiative
- Dr. Richard Butler, Professor and Chairman of the San Antonio Academy Programs
- Ramiro Cavazos, Director, City Economic Development Department
- Dennis Parker, Manager, Workforce Development, Toyota Motor Manufacturing North America
- Leo Gomez, General Manager, Toyota Motor Manufacturing Texas
- Mario Hernandez, President, San Antonio Economic Development Foundation

Interviews

Interviews are the primary source of data for this investigation. Denzin and Lincoln (1994) identify the interview as the most widely used technique in qualitative research. The interview discovers information that may not be observed directly otherwise (Patton, 1990). Interviews helped the researcher gather information that could not be observed otherwise, since the study examines ACCD's economic development activities in the last decade.

Merriam (2001) identifies three approaches to collecting data through interviews: highly structured, semi structured, and informal. The researcher employed the semi-structured approach in this study. The semi-structured approach permitted the researcher to develop questions that were asked of each participant during the interview but also provided flexibility to explore unique perspectives of individuals in different positions as they relate to the economic development activities of the five institutions.

The researcher mailed an informed consent form to each participant and collected it before beginning the interview. The informed consent form included the following, as Rubin and Rubin recommend (1995):

- a description of the purposes of the research;
- a statement of intent to share the results of the study;
- an indication of the degree of the confidentiality of the findings;
- a statement emphasizing that participation was voluntary;
- the potential benefits and risks of participation;
- a consent to tape the interview. (p. 145)

Interview Guide

The researcher developed an interview guide (*See* Appendix C) that indicated the topics, their sequence, and a detailed list of carefully worded questions (Kvale, 1996). The key to obtaining good data from interviews is to ask appropriate and well-designed questions (Merriam, 2001, Fontana and Frye, 1994: Bogdan and Biklen, 1996). The way a question is worded determines how participants respond. The researcher used open-ended questions.

> The truly open-ended question does not presuppose which dimension of feelings or thought will be salient for the interview. The truly open-ended

> question allows the person being interviewed to select from among the person's full repertoire of possible responses. (Patton, 1990, p. 296)

Interviews were one hour long, and the researcher tape-recorded them to assure that all the information was captured (Johnson, 2002; Patton, 1990).

Data Analysis

The researcher collected the data from the interviews and had the tapes transcribed. According to Merriam (2001), "The right way to analyze data in a qualitative study is to do it simultaneously with the data collection" (p. 162). The researcher analyzed and reviewed data as it was collected to ensure the study's progress and focus on the research questions. The researcher developed categories and coded both interviews and written documents pertinent to the economic development activities of the four colleges.

Creating categories focuses data analysis. Merriam (2001) offers the following guidelines to develop efficient and effective categories.

- Categories should reflect the purpose of the research.
- Categories should be exhaustive.
- Categories should be mutually cohesive.
- Categories should be sensitive.
- Categories should be conceptually congruent. (p. 77)

Codes are labels assigned to give meaning to the descriptive information gathered during a case study (Miles and Hobennan, 1994). As Miles and Huberman (1994) recommend, the researcher created a list of codes before beginning data collection and

coded the data once categories were established. After categorizing and coding the data, the researcher wrote the case study report.

Case Study Report

According to Yin (1994, p. 127), "The case study report does not follow any stereotypical form." While there is no prescribed form, Guba and Lincoln (1985) offer guidelines for the report's content.

- An explanation of the problem.
- A thorough description of the context or setting of the investigation.
- A discussion of the elements that are studied in-depth.
- A discussion of the outcomes and what has been learned. (p. 81)

The researcher also referred to the Case Study Report Checklist developed by Stake (1995):

1. Is the report easy to read?
2. Does it fit together?
3. Does the report have a conceptual structure?
4. Are the issues developed in a serious and scholarly manner?
5. Is the case adequately defined?
6. Is there a sense of story to the presentation?
7. Is the reader provided some vicarious experience?
8. Have quotations been used effectively?
9. Are headings, figures, artifacts, appendixes, and indexes used effectively?
10. Was it edited well?
11. Has the writer made sound assertions?
12. Has attention been paid to various contexts?
13. Were sufficient raw data presented?
14. Were data sources well chosen and in sufficient number?
15. Do observations and interpretations appear to have been triangulated?
16. Are the role and point of view of the research apparent?
17. Is the nature of the intended audience apparent?
18. Is empathy shown for all sides?

19. Are personal intentions examined?
20. Does it appear individuals were put at risk? (p. 131)

Validity and Reliability

Due to its applied nature, a qualitative case study must contain procedures to assure valid, reliable results. The investigation must be credible and rigorous.

> Validity and reliability are concerns that can be approached through careful attention to a study's conceptualization and the way in which the data were collected, analyzed, and interpreted, and the way in which the findings are presented. (Merriam 2001, p.200)

Internal validity is the degree to which findings represent the phenomenon in question correctly (Denzin and Lincoln, 1994) and determines how findings match reality. The researcher implemented the following strategies to enhance internal validity:

1. **Triangulation**. The researcher used multiple sources of data to confirm the findings of the study (Patton, 1990).
2. **Member checks**. The researcher asked participants to review the material collected (Janesick, 1994). The people interviewed received the sections of the study that involved their institution via electronic communication and provided feedback and corroborated that all quotes and information were correct.
3. **Peer review**. The researcher asked colleagues to review the findings.
4. **Validity.** The researcher strove to ensure that the investigation was conducted in a way that enhanced the study's internal validity.

External validity is the degree to which findings can be generalized to setting similar to the one in which the study occurred (Denzin and Lincoln, 1994). Generalizing qualitative studies is problematical. The goal of this study was to develop in-depth understanding of selective workforce development activities at the ACCD and the role generated to the Toyota project, not to extend the findings to community colleges in general. This case studied a unique situation, as the data reported and the conclusions reflect. "In qualitative research, a single case or small non-random sample is selected precisely because the researcher wishes to understand the particular case in depth, not to find out what is generally true of many" (Mercian, 2001, p. 208).

Validity is a concern in any type of research, qualitative or quantitative. Research design must incorporate mechanisms and strategies to minimize factors that threaten the study's validity. Eisenhart and Howe (1992) say the following five standards improve validity.

1. Develop an appropriate fit between research questions, data collections procedures, and analysis techniques.
2. Implement effective application of data collection and analysis techniques.
3. Have a thorough understanding of prior knowledge in what is being investigated.
4. Develop a study that will provide value to understanding the phenomenon under investigation.
5. Create a comprehensive and ethical research design. (p. 35)

According to Babhie (1995), reliability is "a matter of whether a particular technique, applied repeatedly to the same object, would yield the same results each time" (p. 124). To a case study's results are reliable, similar findings must be found

investigating the same case (Yin, 1994). To improve the reliability of this study, the researcher provided a description of how the data were collected, categorized, and analyzed.

CHAPTER FOUR

FINDINGS

Analysis of qualitative data and the presentation of the findings and conclusions can range from simply "organizing a narrative description of the phenomenon, to constructing categories or themes that cut across the data, to building theory. Each of these levels of analysis calls upon the investigator's intuitive as well as analytical powers" (Merriam, 1998, p. 196).

The findings for the selected workforce programs and strategies that ACCD developed in response to the region's economic development as well as the perspectives regarding the Toyota Plant recruitment are presented in a comprehensive format. The patterns and themes collected through data analysis are presented in narrative form. In addition, the research data obtained led to a further review of literature that was incorporated in the reporting of the findings.

To garner meaning from the collection of data that constitutes the ACCD report, it must be placed in context with the setting in which it occurred. The account of ACCD's workforce program implementation and response to the economic growth efforts of the region are considered against the backdrop of the city's economic strategies and the Toyota team context. This chapter will describe those particular contexts so that the reader can comprehend the need for understanding those selective strategic workforce programs as well as their participation in economic development, notably the successful Toyota plant acquisition.

The context of the study includes a description of the district's successful economic development strategies, workforce systems, partnerships, challenges, and a narrative of the role that these factors played in the economic development process of the successful Toyota project. The findings of each institution and of the district, as well as the perceptions of the participants, are presented collectively in the following section. As described in Chapter Three, the interviewed participants were classified into two groups: *internal* sources, consisting of ACCD's chancellors and college presidents and *external* sources, consisting of city officials, economic developers, state officials and Toyota Motor Corporation executives.

Overview

The Alamo Community College District serves the Bexar County community through programs and services that help students acquire the necessary knowledge and skills for today's world. In spring 2004, ACCD reported record enrollments of 51,563. Even more significant, ACCD is on the verge of adding a fifth college, Northeast College. In 2004, ACCD successfully acquired over $7 million in grants:

- Toyota Motors—$2.1 million
- Levi Strauss—$2.3 million
- Perkins—$2.1 million
- Tech Prep—$.5 million
- COSA—$.4 million

- Skill Development Fund Health Occupations—$.5 million.

Likewise, the district acquired private-sector training contracts and continuing education fees to support training for companies with another 20,000 students enrolled through the various colleges' Continuing Education and Workforce Development departments. Moreover, the colleges of the ACCD are generally regarded as responsive and flexible. Collectively, ACCD colleges deliver dual credit programs for high school students, customized training programs for business and industry, flexible terms, evening college, weekend college, fast track degree programs, distance learning courses, continuing education and workforce development programs. All of ACCD's colleges are engaged in a $25 million facility expansion project, and strategic plans are in progress to affect a major bond referendum of $450 million to be brought to the voters early next year.

The district's major function in workforce development is to work closely with the City of San Antonio and the State of Texas in adopting an aggressive economic development program and mission. ACCD's leading role involves training a new workforce and assisting incumbent workers with education and training that promotes job mobility and the acquisition of advanced job skills. The district's economic development programs and services are coordinated through the Vice Chancellor's District Office of Professional, Technical and Workforce Education.

In keeping with the mission of ACCD, the college leadership collaborates with area employers to introduce students to career opportunities, integrate classroom and

work-based learning, build educational programs that prepare students for successful careers and retrain workers in need of skills improvement.

Significantly, ACCD's Workforce Development Office collaborated with the Team Toyota initiative resulting in a commitment from Toyota Motor Corporation to build an $800 million manufacturing operation. The development and impact of the Toyota project as well as the participant's perceptions on ACCD's contribution to this paramount economic initiative will be described in the latter section of this chapter.

Role in Meeting Community's Workforce and Economic Development Needs—Research Question One

The data support the ACCD's role in responding to the regions economic growth efforts. All of the participants articulated and affirmed the district's valuable workforce contribution. The ACCD has had a long history of directly supporting economic development through vocational education and contract training. However, as stated by the Vice Chancellor, Dr. Zaragoza, "changes in the global economy require new approaches to supporting economic development" (personal communications, October, 2004). Increasingly, ACCD has assumed a new and emerging role in the region's economic development through expanded institutional goals and mission. ACCD is a comprehensive community college that provides a wide range of programs and services. According to Chancellor Kelly,

> ACCD offers an assortment of technology programs as well as transfer programs, continuing education and workforce development. In essence, we are a true comprehensive community college. Essentially, everything we do is economic development. (personal communications, October, 2004)

ACCD and the Workforce Development Office offer a multitude of occupational programs that promote professional growth and business excellence. The partnerships with business and industry add to the quality of their educational programs and provide community links for colleges and their students. The Workforce Development Office works to meet the exigencies of San Antonio's business and community members. Dr. Zaragoza refers to the district as "the community's college" and points to the importance of meeting the needs of the constituency:

> We constantly align ourselves to the community's needs. The Workforce development office continually assesses the communities' workforce needs and trends in order to provide the most in demand, up-to-date specialized training possible. (personal communications, October, 2004)

The mission of the ACCD Workforce Development is as follows:

> The Alamo Community College District provides accessible, affordable, educational and workforce opportunities for the citizens of Bexar and surrounding counties. The colleges serve as centers of academic excellence, technological advancement and workforce development.

The district's colleges have developed agreements with numerous businesses in the area to provide clinical locations for certain healthcare programs; state-of-the-art equipment for both high- and low-tech programs and highly qualified employees to help with curriculum development and classroom teaching. In addition, business and industry representatives serve on occupational-technical advisory committees at all colleges.

Advance Technology Center

A remarkable partnership between the ACCD and Alamo Workforce Development Inc. led to the development of the ACCD Advance Technology Center, which opened in fall 2002 at the former Kelly Air Force Base. Fundamentally, according to Dr. Zaragoza, "this partnership created additional opportunities for ACCD to participate in economic development activities" (personal communications, October, 2004). Correspondingly, the San Antonio Technology Initiative (SATAI) was established to work in collaboration with the colleges in San Antonio to encourage growth in targeted industries. This initiative was designed to accelerate the creation and expansion of high-paying jobs in the technology industry. The SATAI charts an aggressive economic development scheme that calls for the ACCD to train a new technical workforce and to assist current technology workers with education and training that promotes job mobility and the acquisition of advanced technical skills. The SATAI initiative compels the college district and business sector to organize around four specific driver industry clusters:

1) Aerospace
2) Information Technology and Security
3) Biosciences
4) Manufacturing.

The ACCD Advance Technology Center connects the training resources of the colleges and partnership schools to provide advanced, specialized workforce development training in these emerging technology clusters that have been prioritized by the SATAI initiative. By establishing the center and collaborating with area business, ACCD has created training programs supporting the needs of industry and economic development.

The Academies Program is another stellar way the district helps facilitate economic development. The Southwest Campus offers these academies, one in aerospace and the other in information technology and security, which unite the college, the city, several school districts, and industry representatives in an educational and workshop partnership. Additionally, the district has expanded its dual credit program into several career education fields in order to meet the community need for highly skilled workers. Through these academies, the district not only serves all of the independent school districts with a low number of students seeking higher education but also contributes to the region's industrial development efforts by improving the availability of a skilled workforce.

As stated by the president of Palo Alto, Dr. Guzman,

> The Alamo Community Colleges are the largest providers of job training in San Antonio, and our colleges are the connector between an employer and its unique workforce training needs. Basically, we are the heart and economic engine of the community. (personal communications, October, 2004)

Economic Development is considered a crucial component in the mission of ACCD, and the college plays a fundamental role in promoting economic growth in San Antonio. Dr. Guzman further points to ACCD's role in fostering the constituency needs:

> We must be realistically in touch with the needs and the potential of our community. Therefore, we must be responsive and most importantly make sure that our college participates in economic development, specifically assuring that workforce projects come to fruition so that our students become gainfully employed. (personal communications, October, 2004)

San Antonio colleges have been involved in economic development since their inception. President Runnels of St. Philip's College indicated:

> The programs and services that we have provided since the college has existed, is essentially an economic development initiative. In fact, everything we teach has an impact on workforce development. (personal communications, October, 2004)

The colleges are the primary choice of residents in the region pursuing the goal of making themselves more marketable and employable through higher education. City Economic Director, Mr. Ramiro Cavazos asserts:

> ACCD has a key function in preparing students for jobs but more importantly the colleges are the frontline for our workforce development efforts and consequently our key factor in economic development promotion for site selection activities. Our workforce is the backbone of our community's economic development. As a result, ACCD has taken a critical role in facilitating the regional workforce and economic development activity. (personal communications, October, 2004)

Economic Development Strategies: Research Question Two

Research data indicate the existence of a myriad of ACCD key programs and services that served to facilitate business partnerships that are designed to contribute to regional economic development. Nonetheless, this study examined the selected programs considered by the business and academic leadership as most effective in responding to the workforce and economic needs. The strategies undertaken by ACCD to support and produce economic attainment are delivered by the workforce development office.

Cluster Strategies

Cluster approaches represent ACCD's most innovative economic development practices. Dr. Zaragoza revealed that:

> We have created and established a new cluster strategy. It is a systemic workforce of programs with mixed solutions. Accordingly, it is a system-wide solution requiring organizational changes to establish a coherent framework to guide our instructional program and workforce. This is where our workforce is at its best. It is our ultimate economic engine for our community. (personal communications, November, 2004)

The essential basis of the cluster strategy is a belief that the district—as an economic development intermediary—can significantly impact San Antonio's local and regional economy by: (a) aligning their programs and services in places where common interests exist; and (b) organizing their products and services to assist firms and workers in clusters, rather than unrelated individual companies.

The contribution of the district's cluster strategy is recognized by the city's economic development leadership. In regards to the importance of the cluster approach,

the president of the San Antonio Economic Development Foundation, Mr. Hernandez indicated:

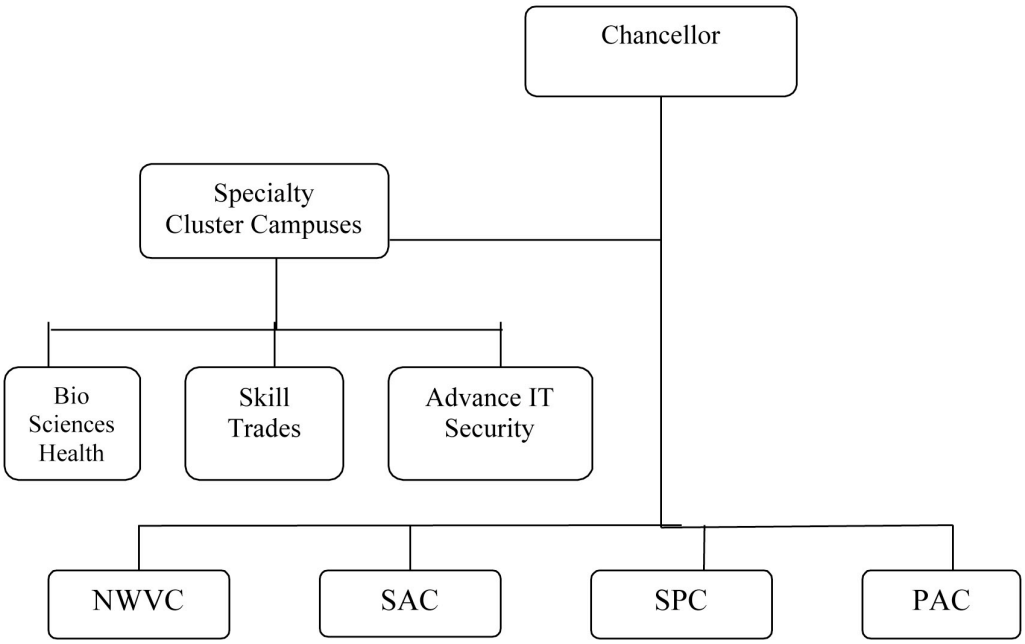
> ACCD's specialty cluster centers are one-stop shops responsible for meeting the education and workforce training needs of the companies that comprise the sector or industry cluster. These cluster centers are places that industry can rely on to understand their particular needs and interests, to help skill related problems and to help assure a continuing flow of new entrants and source of upgrading the existing workforce. (personal communications, November, 2004)

The cluster strategy development is the culmination of numerous industry work sessions involving key San Antonio stakeholders. The industry cluster strategic plan has been effectively implemented by ACCD and has identified the following target industries:

- aviation,
- biotechnology,
- information technology and security, and
- manufacturing.

Organized under the cluster approach, ACCD has worked with the colleges to establish cluster campuses as centers of excellence for a particular sector or industry cluster. As stated by Dr. Zaragoza, "each cluster operates under a matrix organizational structure intended to optimize systemic solutions for the entire district and not necessarily any particular college" (personal communications, November, 2004).

Figure 1: ACCD Cluster Campus Strategy Organizational Structure



The selected economic development programs successfully implemented through the cluster approach have been established at the ACCD Advance Technology Center. Specifically, these highly popular, contributive programs are the partnership academies, which connect to the aerospace and information technology and security sectors.

Aerospace Sector

The most successful partnership academy is the Alamo Area Aerospace Academy (AAAA), which targets one of San Antonio's largest industries—the aerospace sector, one of the region's core driver industries and a major source of high-wage/high-skill jobs

that are integral to the city's prosperity. However, the industry faces the problem of finding a sufficient source of highly skilled workers to support business expansion and replace the large numbers of employees expected to retire over the next decade. Correspondingly, ACCD has addressed this workforce demand, as Dr. Ziegler, President of San Antonio College, explains:

> The Academy is a unique and innovative partnership throughout the county that includes business and industry providing dual credit programs into lucrative career fields. This community partnership is a strategy that provides our youth with higher education, experience and significant employment opportunities in the aerospace industry. (personal communications, October, 2004)

Information Technology and Security

The Information Technology and Security Academy (ITSA) is another fruitful strategy generating economic benefits to the region. Starting in fall 2002, ITSA is the newest program to be implemented by the district. It is a collaborative effort among the ACCD, the San Antonio Technology Accelerator Initiative, The Center for Infrastructure Assurance and Security at the University of Texas San Antonio, the City of San Antonio, local industry partners and the 18 school districts in and around Bexar County. This academy was modeled after the AAAA and created to meet the employment demand of the growing information technology and security industry. Students participate in dual credit programs and internships, and, as with the participants of the AAAA, they can use their credits to pursue a college degree or obtain jobs with the government, military or aerospace and technology industries that are expanding in the region.

ACCD Community Partnerships

As indicated by Dr. Kelly, an economic development strategy was to produce communitywide workforce partnerships. He stated: "ACCD has successfully implemented workforce development partnerships with the San Antonio business community to ensure a highly trained workforce" (personal communications, November, 2004). Respectively, these alliances enhance the practical experience for students and promote accelerated entry into the workforce. The Workforce Development Office, located at former Kelly Air Force Base, works with area businesses to access and meet local workforce development needs through continual education and training. ACCD's business partnerships include all 18 Bexar County school districts, aerospace industry employers, ACCD and the Greater Kelly Development Authority.

As previously described, the significant joint venture between the ACCD and Alamo Workforce Development Inc. resulted in the creation of the Advance Technology Center. This strategic center connects the training resources of the ACCD colleges and partnership schools in providing advanced, specialized workforce development training in certain emerging technologies. These education initiatives are the key economic strategies consisting of specialized training for targeted sector industries in aerospace avionics, automated manufacturing, computer information security assurance and e-commerce. The center is equipped with state-of–the-art equipment including wired and wireless Internet connectivity, a three-screen, 100-seat multimedia auditorium, satellite

down linking, videoconferencing computer labs, and many other educational technology innovations.

College Partnerships

In order to meet the educational and economic needs of San Antonio's community, the Workforce Development Office of ACCD continually searches for potential new partnerships. In addition to the successful academies program, the following workforce projects have also been effective district partnership plans that have produced economic development contributions for the ACCD partners: City of San Antonio: Bexar County Juvenile Justice, University Hospital, Baptist Hospital, City of San Antonio, Project Quest, Alamo Workforce Development and the Texas Workforce Commission. The following programs are valuable community partnerships for the colleges:

Table 1: Community Partnerships

College	Partners
Northwest Vista College	Southwest Research Institute
	PacifiCare
	Citigroup
	Optum
	World Savings
Palo Alto College	Baptist Health System
	Texas Parks and Wildlife
	Bexar County
	Toyota Motor Manufacturing
St. Philip's College	Boeing
	Howard Aviation
	General Motors
	Lockheed-Martin
	Mooney
	Standard Aero
San Antonio College	VA Hospital
	Austin Parole Board
	Citibank
	Southwestern Bell
	University of Texas at San Antonio
	United State Automobile Association

Another productive strategy used by the district to influence economic growth is the establishment of an employer clearinghouse. The office is a customer-driven, one-stop clearinghouse that connects employers to ACCD training and workforce resources in the aerospace, information systems and e-commerce industries. Moreover, the center also connects directly to the San Antonio Economic Development Foundation. As Dr. Zaragoza reports:

> The clearinghouse allows ACCD to meet with business prospects during the initial phase of the business development process. Business prospects are advised of community college resources, programs, and customized

> training capacity. ACCD assures potential businesses that the district will work to meet their workforce development needs by offering just in time training, customized instruction and curriculum. (personal communications, November, 2004)

Factors Contributing to Program's Success

A common theme evident throughout the discussions of the college's economic development strategies was the importance placed on effectively establishing **partnerships**.

The most critical factor identified for developing successful workforce activities throughout the district was the fostering of business, government and community relationships. The power and vision of what developing strategic partnerships and alliances can accomplish was captured in the strategic plan of ACCD, represented by one of the participants, Chancellor Dr. Kelly, "Our partners work with us to provide innovative solutions neither of us could provide alone" (personal communications, October, 2004). Appropriately, partnerships are perilous in achieving the district's mission and must be developed with partners internal to the district and more importantly with partners external to ACCD.

Leadership surfaced as another important factor in developing successful economic development programs. Dr. Butler, Chairman of the Academies Program, added, "college leadership has been highly instrumental in shaping the progressive workforce culture that is evolving in San Antonio" (personal communications,

November, 2004). Leadership does matter and is indeed a driving factor in ACCD's growing culture of embracing the region's economic development.

In addition to partnerships and leadership, other selective elements described by the region's economic development leadership participants were: competency of faculty, curriculum, facilities, marketing and job placement.

Challenges for Workforce and Economic Programs

To investigate the challenges facing ACCD's contribution to economic and workforce development, the participants were asked to describe their experiences with the major issues facing ACCD related to providing and attracting business and industry partners.

As indicated by Dr. Claunch and Dr. Runnels, the most significant challenges in being able to participate effectively in economic development are a lack of funding and budget restrictions. Dr. Claunch explains: "in order to fulfill its economic development mission, the colleges must obtain funding from a variety of sources and often compete with other institutions for grants, contracts and programs" (personal communications, November, 2004). Dr. Runnels concurred, stating: "To effectively compete, our colleges must obtain business and entrepreneurial skills" (personal communications, November, 2004). She went on to say:

> The districts staff needs to remain familiar with entrepreneurial activities and the new infrastructure of the district must continuously be updated to support the knowledge of the economy in effort to anticipate the

> community's economic workforce needs. (personal communications, November, 2004)

The administrative structure and policies of ACCD are being strategically aligned to promote entrepreneurial and workforce efforts. Dr. Butler elaborated: "some colleges seem to have been very efficient and productive in becoming entrepreneurial while others have done little in this emerging area" (personal communications, November, 2004). Furthermore, he stated:

> Increasingly, the colleges must now earn their way in a growing, demanding, consumer driven workforce and society. They have no monopoly as the providers of workforce training and high-tech skills necessary for employees to apply in today's new knowledge economy. Correspondingly, ACCD is adequately facing this challenge. (personal communications, November, 2004)

In addition to the key issue of funding, other areas centered on the challenges of promoting economic development include: technology, bureaucracy, competition, public recognition and qualified personnel.

Instrumental Strategies for the Team Toyota Project—Research Question Three

Years of marketing and relationship building came to fruition for the economic development leadership in spring 2003 when Toyota Motor Corp. announced that San Antonio would be the location for the $800 million, 2000-employee truck manufacturing plant. Toyota considered 19 other sites in Texas, as well as a number of sites in Alabama,

Arkansas and Tennessee. The new plant will be called Toyota Motor Manufacturing Texas (TMMTX).

As described in Chapter One, the San Antonio Team Toyota took the lead in building a unified group of community leaders who showed Toyota Motors how serious they were about landing this paramount project. The Toyota team consisted of three main components involved in bringing this project to reality: the local higher education committee, the City of San Antonio/Bexar County team and the state team. The local higher education committee consisted of the district's vice chancellor and the four ACCD college presidents. Specifically, Team Toyota was comprised of:

- State of Texas,
- City of San Antonio,
- Bexar County,
- City Public Service,
- San Antonio Water System,
- Southwest Independent School system,
- ACCD,
- University of Texas San Antonio,
- Economic Development Foundation,
- Chamber of Commerce, and
- several major San Antonio Corporate executives.

Toyota Economic Costs and Impacts

The significant economic impacts provided by Toyota consist of 2,000 full-time direct jobs in phase I, and potentially 2,000 additional jobs in phase II. The potential jobs from suppliers are planned to be approximately 5,300. The Annual direct payroll is anticipated to be over $100 million. The expected annual salaries of workers are estimated to be $50,000 to $70,000. Construction started in winter 2003 and production is anticipated to start in fall 2006. Other economic impacts include: $24 million in ad valorem tax revenue for the city over 10 years, the revitalization of the targeted area of South San Antonio, creation of jobs for the empowerment zone residents and the facilitation of economic development at Brooks Base and Kelly USA. The total local and state direct incentives were valued at $134 million (as represented in the following table).

Table 2: Total Local and State Direct Incentives

The City's Team Toyota Financial Commitment (approximate):	
Land acquisition	$16 million
Site preparation	$10 million
Training facility	$3 million
Financing costs	$5 million
Payment on interim financing	$4 million
Total funding commitment	**$38 million**
City Sources of Funding	
Taxable Revenue Bonds	$27 million
EDA Grant	$9 million
Contribution from Toyota	$2 million
Total source of funds	**$38 million**
County Commitments	
Fee waivers	$4 million
10 year phase in tax abatement	$78 million
Less Toyota voluntary Payment to School District	$(34 million)
Total tax phase-in & fee waiver commitment	**$48 million**
State of Texas Direct Commitments	
Workforce Training Development (Phase I)	$28 million
Rail improvements and extensions	$15 million
Total state obligation	**$43 million**
San Antonio Water System	$4 million
Kelly USA (temporary facility)	$1 million
Grand total city, county and state	**$134 million**
Indirect State and County Transportation Improvements	
State of Texas Public infrastructure improvements	$39 million
Bexar County Public Road Improvements	$18 million

Toyota Benefits

The benefits outweighed and exceeded the financial commitments and economic expectations. According to the analysis by the Institute for Economic Development at the

University of Texas San Antonio, the payback period on the return of local and state investments is approximately 2.5 years at an annual rate of return of 18.5%.

In addition to the jobs that will be immediately created, the Toyota Tundra auto assembly plant will have a remarkable impact on the long-term economic development efforts. Mr. Hernandez described an automotive assembly plant as "the Holy Grail for economic development because there is a tremendous job multiplier" (personal communications, December, 2004). Multiplier factors from existing U.S. motor vehicle manufacturing plants estimate the ratio to be approximately 5 or 6 to 1. What this means is that for every job created, there are between 5 or 6 indirect jobs created in auxiliary sectors such as Toyota's suppliers. Consequently, in addition to the construction jobs, the San Antonio Economic Development Foundation (SAEDF) conservatively projects the creation of a minimum of 5,300 spin-off jobs with a potential based on the multiplier factor for up to 13,000 additional jobs.

Toyota Motor Corporation of North America

Toyota, a name that has become synonymous in industry circles with quality, lean manufacturing and just-in-time production. Toyota Motors began importing vehicles into the U.S. in 1957. In 2003, Toyota sold over 1.8 million new vehicles through approximately 1,200 dealerships in the U.S. This was Toyota's best sales performance in its 46-year history (Toyota Motor Sales, 2004). Its success in capturing the auto market is due to the quality, dependability, and reliability of its products. With these strong

attributes, Toyota has grown to become the world's second largest automaker and the fourth largest in the U.S.

In the view of many, Toyota Motor Corporation has become the symbol of transition from American to Japanese production methods (Bosman, 1999). Toyota now commands the same degree of respect and fear in the industrialized world as the Ford Motor Company and General Motors did during their heydays in the postwar period. Indeed, few organizations in the world enjoy Toyota's prosperity and power (Besser, 1996).

Toyota Motor Manufacturing in North America

Increasingly, Toyota is expanding their autonomous production operations (operating functionally independent auto plants) in North America, now called Toyota Motor Manufacturing of North America (TMMNA). The only function still under control of Toyota Motor Corporation is the making of strategic geo-political decisions affecting overall global operations across five continents, and 35 foreign subsidiaries and affiliates. There are several reasons behind the establishment of Toyota North America. First, its establishment was in line with Toyota's Global Plan to enhance organizational efficiency, streamline administrative expenses and manage risk by introducing new financial instruments (Aichi, 1998). "We need to be more flexible, more nimble and act quickly," claimed Mr. Parker, Manager of Workforce Development Toyota Motor Manufacturing North America (personal communications, November, 2004). Second, it was a key

element in Toyota Motor Corporation's global strategy of "global localization"—creating autonomous production operations in the four major production regions: North America, Europe, Asia and Japan. An additional purpose for global localization, as mentioned by Mr. Parker, "was to insulate Toyota from what happens in any one country" (personal communications, October, 2004). Furthermore, given the rapid global consolidation of the auto industry into a few global giants, auto manufacturers from Japan have been compelled to reassess their own strategies. "Toyota now includes the socio-political concerns emanating from its three major regional economies in its annual planning and organization," (personal communications, October, 2004) asserted Mr. Parker. As a result, in following Sony and Honda's lead, Toyota has launched an ambitious multiyear globalization strategy in the U.S. The former CEO of Sony, Akio Morita, coined the term "global localization":

> A process by which multinational corporations should develop strategies at the local level and allow local operations autonomy and decision-making power to tailor those strategies to suit unique local requirements. With an understanding of global directions as a base, local management must then make operational decisions that relate meaningfully to the labor forces and the communities on a local level. (Leuenberger & Weinstein, 1992, p.128)

Toyota and the Auto Transplant Strategy

It is this type of leadership planning that brought Toyota Motors Corporation to develop the most effective strategy to consolidate Toyota's North American manufacturing operations by localizing its purchasing, financing, and marketing in North

America. The strengthening of the yen and continuing global financial instability prompted this strategy. Global localization was also a response to the very real threat of economic sanctions. As a Toyota official noted: “It will now be very difficult for the Big Three to attack us, as an enemy at the border. We're across the border and we're here” (Greenwald, 1996).

Under this new organizational structure, Toyota has been able to increase the localization of management, research and development, and procurement of parts in the U.S. Appropriately, global localization has allowed Toyota to cut overhead by spreading design and development costs across a greater number of global platforms. Simultaneously, global localization has lowered its operating costs across the different national markets, while at the same time improving morale, attracting, and retaining local managers, as well as pacifying its critics by enhancing the image of its U.S. subsidiary operations (Besser 1996). Similarly, global localization has directly enhanced Toyota Motor Manufacturing North America’s economic and political power by enabling it to play the competing interest of states and local communities off against one another, such as the case between Texas and Arkansas in the decision to locate in San Antonio, Texas.

Toyota Motors Production Systems

Over the past century, Toyota has developed and perfected an operations philosophy, which cuts costs and lead time within their factories without sacrificing quality or customer service. “Many manufacturing firms envious of Toyota’s quality,

productivity, and profit margin have attempted unsuccessfully to implement the Toyota Production Systems, also called lean manufacturing, on their production operations" asserted Dr. Goldsmith, Executive Director of the San Antonio Technology Accelerator Initiative (personal communications, November, 2004).

The Toyota Production System has become the world benchmark for excellence in factory operation systems. "In fact it is unusual to find a modern factory that is not trying to incorporate the Toyota Production System into its operations," indicated Mr. Gomez, General Manager of Toyota Motor Manufacturing Texas (personal communications, December, 2004).Toyota's principle is based on the Toyota Production System—*Kaizen* or continuous improvement. *Kaizen* is the guiding principle for improving the job process flow by discovering and eliminating waste and encouraging team members to take part in managing and improving their own jobs. Toyota's philosophy is that the improved approach promotes the proactive versus reactive approach, resulting in the improvement process and prevention of problems. Likewise, the Toyota Production System emphasizes rationalization of production. Lean production comprises two key principles—the concepts of *Jidoka* for providing quality products at lower costs, and *Kiichiro*, for just-in-time production and delivery systems. In turn, by raising efficiency and perfecting quality, the Toyota system motto is "Do it once – right!" Consequently, Toyota's product development performances are measured by product quality speed to market, and subsequent manufacturing efficiency surpasses the entire automotive industry.

The primary goal of the Toyota Production System is to increase profit by reducing costs and increasing productivity; this is achieved through the elimination of waste in the system (Monden, 1998). In turn, the Toyota System is called lean manufacturing because it seeks to do more with less on the entire production operation.

Team Toyota Approach

Toyota's approach on improvement efforts views the operation as a socio-technical system integrating people, process, and technology. This holistic approach to product development is central to Toyota's outstanding performance in product development and key enabler of the entire Toyota Production System. Team Toyota's strategy utilizes a "unified and holistic approach combined with the successful Advance Technology Center workforce programs evidenced by ACCD made an impression and a big difference" reported Mr. Parker. (personal communications, December, 2004).

Mr. Parker identified the San Antonio colleges as the ideal conduit to recruit, transform, and prepare potential students for becoming Toyota team members. He indicated, "In order for our new team members to reap the true benefits of the lean philosophy, it will be necessary for the ACCD to expand the student's lean thinking beyond their basic college education" (personal communications, December, 2004). As previously described, "the district's workforce programs that evidenced the ability to produce qualified students were the ACCD academies," stated Dr. Butler (personal communications, December, 2004). The technology required for aerospace training is the

foundation for high-performance maintenance and manufacturing that is also necessary in the auto industry. In addition to the aviation industry programs, the district colleges such as SAC offer a relevant industrial electronics degree. Palo Alto College offers two new electro-mechanical courses designed to prepare students for jobs in industries such as manufacturing and traffic management. Simultaneously, the strategy to develop a workforce education and training proposal for the Team Toyota project demonstrated the district's capability and capacity to customize the training necessary for Toyota. This strategy consisted of developing a comprehensive plan that comprised all of the colleges' program strengths and capacities. Thus, a matrix with a compendium of key Toyota occupations and requirements was assembled to solidify that all of Toyota's needs were satisfied. As shown in Appendix B, a strategic matrix plan was created detailing the ACCD's training areas meeting the needs of the Toyota assembly project occupations.

Perceptions of ACCD in Team Toyota Project—Research Question Four

The exceptional quality of technological requirements by Toyota generated a challenge and an opportunity for San Antonio. In that respect, Ms. Rath, Commissioner of the Texas Workforce Commission, indicated, "The Alamo Community Colleges are ideally positioned to meet the education and training exigencies of Toyota Motors in San Antonio" (personal communications, November, 2004). Equally important, ACCD played a fundamental role in convincing Toyota that a qualified workforce pool could be

delivered by providing unique and effective customized programs," asserted Mr. Parker (personal communications, December, 2004).

In describing San Antonio's economic development, Dr. Goldsmith emphasized the importance of quality as the key to a successful future employment generation:

> Measuring the quality of life is done by evaluating the personal income and job rate. However, this is achieved only by providing a continuous learning environment and the colleges must successfully continue to correlate these programs with the San Antonio community. (personal communications, November, 2004)

In addition, Dr. Goldsmith elaborated about the ACCD meeting the community's needs.

> The need of a synergistic relationship between San Antonio industry demand and workforce supply has been productively created. ACCD has provided this strategic initiative. Indeed this philosophy is in line with a realistic approach, allowing valuable workforce and economic development to flourish in the region. The evidence to this strategy has been the aviation sector and now especially the decision of Toyota to locate in San Antonio. (personal communications, November, 2004)

As highlighted by the Mayor of San Antonio, Mr. Garza, "ACCD was instrumental in the Team Toyota promotional efforts by developing an educational and training proposal that demonstrated their ability to identify with the technological requirements in the 21st century workforce." (personal communications, October, 2004).

Building Cars and Producing Workers

The globalization of the auto industry has boosted competition among all motor manufacturers and has prompted constant innovations in the product design and manufacturing process. This has resulted in a proliferation of product innovations,

requiring rapid designs and production on new models aimed at many types of market. Mr. Gomez provided his perspective:

> Toyota must remain fast and flexible in implementing new production techniques. These smaller production runs and mass customization under Toyota's Production Systems will require our operation to put the top resources in the right place at the right time, driving the manufacturing to change production inputs immediately and accurately. Simultaneously, it will be implemented with Toyota's reputation of quality and efficiency. (personal communications, December, 2004)

Mr. Parker's comments exemplify this view:

> Auto manufacturing is being done dramatically differently than it was just a few years ago, or in some cases, a year ago; as a result, there is a very large demand for effective workforce development. Beyond education in concepts such as Six Sigma, lean manufacturing and work cells; beyond foundation skills such as written and oral communication, problem solving and team-building is "anticipatory learning," or preparing workers to adapt to rapidly changing technologies. Toyota is looking for highly skilled employees who understand and can improve our entire processes of manufacturing, including those involving external suppliers. (personal communications, November, 2004)

The essential workforce necessary to address these skills will be demanding and expectations will be crucial. As Mr. Mosley, Executive Director of the Texas Department of Economic Development concluded, "The leadership of San Antonio was very effective in providing Toyota the assurances in obtaining the quality workforce for the auto manufacturing operation" (personal communications, November, 2004).

Training and Development

Toyota has special manufacturing skill requirements for their employees. In addition to the many types of engineers utilized in the Toyota truck operation, the

majority of occupations will exist in the production process, necessitating comprehensive skills to meet Toyota's Production System. Mr. Gomez reports that, "just as the Alamo Community Colleges have contributed to the economic development of the city, they will provide the constant pipeline of quality employees for the Toyota plant." He further added, "compellingly, Toyota's selection for qualified employees is very strict and intense" (personal communications, December, 2004).

The following is an example of the maintenance function skill requirements. These functions are broken into four primary skill areas: Fluid systems, Electrical, Mechanical, and Machining/Fabricating. In addition to the skills expected to be possessed by the job candidates, a rigorous three day assessment is conducted by Toyota officials (see Appendix D).

Interestingly, Toyota officials researched the ACCD's workforce programs by examining the results from existing programs in San Antonio. "Toyota implements an extremely high level of trade skills requirements. Resultantly, the data obtained from feedback and direct research was very impressive," stated Mr. Parker (personal communications, December, 2004). He further stated, "the brief workforce history demonstrated by the academies and college programs from St. Phillips, specifically their venture with Boeing, exceeded our expectations (personal communications, December, 2004).

In line with Toyota's Production System, the element of work teams approach incorporated by the ACCD into the Team Toyota promotional strategy resulted in one of

the most valuable location factors. “The colleges worked great together as a team, unlike other institutions, the colleges did not compete with each other in providing a unified front to facilitate and deliver customized workforce programs,” emphasized Mr. Gomez (personal communications, December, 2004). In addition, the district established the key factor of responsiveness. Mr. Parker explained, “the complete team approach by the ACCD demonstrated total flexibility in accommodating Toyota’s requirements and needs”. Additionally, he found “the college evidenced to have great resources, professional and technical staff, and conveniently, the facilities ready for immediate use” (personal communications, November, 2004).

Conclusion

The perspectives provided by the Team Toyota leadership group, notably the Toyota officials, cited many contributing factors to the decision to locate to San Antonio, Texas. However, the availability of a **qualified workforce** was the overwhelming factor highlighted by all participants as the nexus of the economic development for the region and as a vital factor for Toyota Motor Corporation to favor Texas. Simultaneously, the **partnerships** from the Alamo Community College District were portrayed as a key **leader** in facilitating this qualified workforce by providing the **customized training** needs of business and Toyota.

In retrospect, the perceptions of the Team Toyota leadership specify that ACCD has been effective in responding to the economic growth needs of the region and in

contributing to the Team Toyota project. Ms. Rath reported, "ACCD made a decisive commitment in providing the necessary qualified and trained manpower. The single key strategy was being company responsive" (personal communications, November, 2004). In addition, Mr. Parker identified, "the response to customized training has been the fundamental strategy by ACCD, and it certainly attracted and convinced Toyota."

Furthermore, Dr. Butler's perspective on the district said it best:

> ACCD has the attitude of creating the student demand by bringing industry and business to be integrated inside the colleges to respond to the student's immediate needs.
>
> Nonetheless, from a pure economic development perspective, the outstanding strategy approach by the ACCD was to focus on the employer as the customer. (personal communications, November, 2004)

Summary of Findings

This chapter summarized and analyzed the data collected for the study using narratives to describe the findings. The research questions and profile comparisons provided valuable perspectives of the data. The fundamental competencies identified by the research as key strategies in economic development and in Team Toyota were **customized workforce**, **partnerships**, and **leadership**, while the challenges consisted of funding, dealing with change, and public recognition. Additionally, the basic location factors identified in the recruitment strategy which made San Antonio a suitable site were those related to the specialized production requirements of Toyota Production Systems. Chapter Five discusses the implications of these findings.

CHAPTER FIVE

TOYOTA AND BEYOND

Summary, Discussion, Conclusions and Recommendations

This research was conducted for the purpose of examining perceptions among economic development and college leaders from San Antonio regarding the role of ACCD in economic development and the Team Toyota acquisition. Selective economic development activities of the ACCD highlighted in a comprehensive literature review and through interviews were used to measure perceptions.

This study identified particular programs and services that the district has developed and employed to promote economic growth, specifically in the recruitment of the Toyota Motor Manufacturing plant. Data were collected from two groups of participants selected to be interviewed, which were classified as follows: *internal* sources, consisting of ACCD's chancellors and college presidents, and *external* sources, consisting of city officials, economic developers, state officials, and Toyota Motor Corporation executives. Four research questions were examined in the study related to ACCD's contribution to economic development and to the participation in Team Toyota. As described by Guba (1981) and Patton (1990), the framework of the study was grounded theory through naturalistic inquiry, personal contact and insight, openness through inductive analysis, and design flexibility.

Community colleges exist in a turbulent environment with rapidly changing technology and shifting workplace demographics. No longer can the traditional practices

of education delivery meet the changing demands of employers. With new competition, such as private providers and courses delivered through satellites and the Internet, community college leaders can no longer expect past practices to guarantee success. This new paradigm has influenced ACCD leaders to become more responsive to their external environment. These leaders have transformed their institutions into centers that support economic development through workforce training with programs that meet the needs of regional employers. Not only have ACCD leaders made this transformation, they have also institutionalized change to ensure continued success. Correspondingly, as the findings in the study illustrate, the Toyota manufacturing plant is a strategic economic development project that resulted in a decision-making process involving the workforce programs of ACCD.

Summary of Findings

The study demonstrates that Alamo Community College District has a lengthy history of working with business and industry to develop and improve the skills of the area workforce. The district's four colleges represent a necessary ingredient in San Antonio's strategic plan to accelerate the creation and expansion of high-skill, high-wage jobs. ACCD provides workforce programs to the San Antonio constituents with access to better employment opportunities and a more fulfilling life through higher education. In turn, the outcome of the Toyota initiative demonstrated the value the district workforce programs bring to the region's economic development.

The first research question relates to the role ACCD played in economic development activities in order to respond to the region's workforce needs. As detailed in Chapter Four, the four community colleges of the Alamo Community College District offer a wide range of traditional and advanced programs designed to promote economic development in the San Antonio region. The most active efforts toward economic development are in the following: education, workforce development and training, business and industry recruitment, technology transfer, and partnerships.

The second research question explored ACCD's particular strategies as the most successful in attracting business and industry. As a whole, the best approach was establishing **partnerships** and dynamic **leadership**. Specifically, the successful strategies implemented to target business recruitment included the **industry cluster** approach, the **Advance Technology Center** and the **Academies**.

Research question three examined the district's leading strategies developed to contribute to the Team Toyota project. The customized workforce training highlighted in the Advance Technology Center and the Academies program was pivotal in demonstrating the district's capabilities for specialized training. Namely, these highly popular, contributive programs were the partnership Academies that connect to the **Aerospace, Information Technology and Security** sectors. A significant result from these effective strategies resulted in the creation of a fourth Academy program, the manufacturing academy, which has started in fall 2004.

The fourth question addressed the participant's perception in regard to the district's contribution to the fruitful Team Toyota project recruitment. As explained in Chapter Four, Toyota's primary site location decision relied on their quality production system. As a result, through the Texas Team Toyota, ACCD not only demonstrated the district's willingness to **customize the workforce** programs effectively but also evidenced the ability to deliver the **quality training** required by Toyota.

Summary of the Texas Toyota Manufacturing Site

Traditionally, the rationale in the selection process by Toyota Motor Corporation is a unique strategy that principally revolves around the Toyota Production System. The Toyota Production System, as described in Chapter Four, requires a particular kind of environment and social structure. Accordingly, in San Antonio's situation, Toyota's site selection process was driven primarily by the structural requirements of its production regime, Toyota Production System, as well as some of the socio-political factors that would have a bearing on workers and their families.

Historically, geographical location theorists assert that agglomeration network or industry clusters are the first critical factors to traditional locational decisions. In contrast, the data obtained from the research illustrates that a key decision factor for Toyota to locate in San Antonio was the emphasis on the importance of a community that demonstrated **team work**, **leadership** commitment, and, most importantly, the

availability of a **skilled workforce** as well as providers of high-performance education institutions delivering **customized training**.

Site Selection Factors of Toyota

Table 3 illustrates the key factors that influenced Toyota in their site-selection process.

Table 3: Key Factors that Influenced Toyota in Site Selection Process

Product-Related Factors	Resource-Related Factors	Sociopolitical Influences
Quality of workforce	Workforce training education	Incentive package
Good transportation	Proximity to suppliers, utilities, and competitors	Local and state marketing
Proximity to markets		Tax incentives
		Community reception

Other important factors that contributed to the selection of the site were the geographic centrality and certain inherent characteristics of San Antonio. Toyota's just-in-time production system and the Texas transportation network system dictated the choice of the location. Thus, a well-developed transportation system with easy access to the major interstate highways, including proximity to Mexico, favored the San Antonio/Central Texas region. In addition, the immediate area's well-integrated and multi-modal rail/truck and rail sea connections through the Texas ports made San Antonio very attractive. In consequence, the Texas Team Toyota possessed all of the

requirements and demonstrated a strong willingness to furnish any additional requests in order to exceed Toyota's expectations.

Discussion of Findings

The college and economic development leaders interviewed in this study all viewed economic development as a primary mission of the Alamo Community College District. ACCD plays a crucial role in the region's economic growth. Based on the information gathered in the interviews, these institutions are now being looked to for leadership in facilitating economic development. As discussed in Chapter One, community colleges will continue to be asked to fill crucial roles in this process and expand economic development activities by considering new purposes and forming new partnerships with public and private groups interested in the economic well-being of their communities. Chapter Two noted that the areas with the highest levels of educational attainment are those experiencing the fastest economic growth. This presents a challenge in the city of San Antonio due to the low level of educational attainment of the citizens of the region. In order to accomplish these role issues, ACCD Chancellor Dr. Kelly revealed that: "external forces and conditions, constituent expectations, role definitions, policy changes and resources allocations must be considered." Therefore, ACCD has evolved beyond the tradition of open access, vocational education and transfer college, to focus strategically on the needs of the new economy. Accordingly, ACCD has embraced a new mission to meet rapidly changing local workforce development needs.

The research revealed that economic growth and labor market changes put pressure on businesses to seek highly qualified workers. As the new economy and employment needs change rapidly, being labor market responsive requires a proactive approach on the part of the colleges. The college and economic leaders must anticipate change and, more importantly, have structures, processes, existing partnerships, and effective leadership to respond to the ongoing opportunities and challenges. Respectively, ACCD has demonstrated a systemic approach responsive to the economic development needs of the region and will continue developing strategies to respond to change.

Economic Development Connectivity

The data presented in Chapter Two supported the premise that the primary role of community colleges in economic development has been to prepare people to enter the workforce. This study's findings are consistent in that the Alamo colleges all identify their major contribution to economic development as educating and training their constituency for rewarding careers in the changing economy. The Alamo Community College District provides workforce training through traditional academic programs that emphasize technical training as well as transfer programs, and training and retraining the existing workers through pre-employment and contract training for business and industry. As discussed in Chapter Two, a conclusion drawn in this study supports the view held by Bogart (1994). He expressed that technical education is parallel to economic development; thus, in practice it is difficult to distinguish between the two terms. This

was the context in this study, the terms workforce and economic development are used interchangeably. Likewise, the economic development efforts of ACCD are so completely tied to workforce training that the district does not separate or make a distinction between the two terms.

As the literature indicates, workforce is an increasingly critical field in which community colleges continue to focus activities and efforts. ACCD has developed programs to train the workforce with the most advanced technologies to meet the exigencies of today's global economy. This research found that all of the four institutions consistently placed importance on influencing business and industry expansion as well as retention.

ACCD has created a proactive cluster approach to build the skills of the region's workforce for the local industry. The district develops realistic curriculum that matches up to the expected needs of the region's business. Appropriately, the district collaborates with a network of economic development partners consisting of regional stakeholder organizations. This collaboration results in identifying the best curriculum and then adapts that curriculum to the new learning technologies, thereby reducing "cycle time" for workers to acquire necessary skills and knowledge.

In consequence, ACCD's economic development strategies aim to work with industry to develop skill standards, develop and test more effective learning activities using simulation and adaptive learning, and promote articulation and collaboration

among the local high schools and the universities for automotive industry career preparation.

Although business expansion and retention are part of the district's economic development activities, there is now a major emphasis on the involvement of business and industry recruitment. As evidenced by the location decision of Toyota, ACCD's strategy to participate in industry recruitment initiatives will prove to be a productive long-term approach to the future economic growth of the San Antonio region.

A key competency found in this study and identified throughout the literature on how colleges promote economic growth was the notability of developing and maintaining **partnerships**. Building mutually beneficial partnerships was an overarching theme and pattern throughout the interviews. Fundamentally, throughout the interviews the most consistent message expressed by the college presidents and economic leaders was necessitating the establishment and maintenance of college, government, and business partnerships. Leveraging effective partnerships and alliances will clearly enhance the ability of institutions providing workforce customized training to address the challenges faced both today and in the future.

As explained in Chapter Four, leadership was another theme that was consistently identified by the study participants as an integral factor in promoting successful economic development. All of the participants interviewed affirmed the belief that the degree to which the college presidents devote attention to economic development, and the extent to which resources are allocated, are key aspects in effectively developing and sustaining

commitment to regional economic initiatives. Furthermore, the emphasis of institutional presidential leadership and commitment of economic development efforts is imperative if these institutions are to be successful in establishing a leadership role in economic development in the San Antonio region. Kingry (1984) noted, "consequently, a college president's perceptions of the institutional role in economic development are important for these vital activities to materialize into practices, and this close coordination is to become reality." Throughout the study's interviews, this view was confirmed from all of the economic development leaders.

In summation, the information on economic development and community colleges revealed a wide range of diverse programs and services that these institutions strategically utilize to contribute to regional economic development. As a result, this investigation case study found that ACCD is effectively pursuing economic development participation by implementing emergent workforce programs in response to existing industry and future manufacturing industry as determined in the Toyota project. Additionally, the new economic development role of community colleges explored in Chapter Two is exemplified by the systemic workforce programs at ACCD. These activities include customized and contract training, local economic planning, and establishing business incubators. The data in this study found and explored each of these emerging economic activities throughout the district.

Perceptions of the Alamo Community College District

In regards to the participant's perception of the role of community colleges in economic development, all of the college leaders reported having an increased role in economic development. Concomitantly, the external sources that were considered as the economic development leaders, viewed the district as a vital component and participant in the economic development efforts. As a result, all of the respondents stated that the major role of the district was to provide business with an educated workforce, fulfill the mission of the institution, provide leadership, build community partnerships, assist with business development and technology transfer, and utilize faculty expertise with the business community.

In the instance of the Team Toyota project, extraordinarily, all of the external participants articulated that the district had a determinative role and positive contribution to the outcome of the Toyota decision to locate to San Antonio. Meanwhile, comments made during interviews with both internal and external sources also confirmed the general public's lack of understanding of community college activities related to economic development and their contribution to the Toyota initiative. This dichotomy indicates the need for improved understanding between college leadership and the San Antonio general constituency.

The findings in this study also indicate that communication among the college leaders and the economic development professionals is effectively disseminated and coordinated. Nevertheless, communication is lacking between the college leaders and the

general public constituency. The literature in the study was clear that close cooperation among community colleges, economic developers and the general constituency is necessary for successful economic development. These findings illustrate that purposeful dialogue between the groups is needed to insure successful collaboration and closer coordination of effort. Kingry's (1984) summary of the need for close coordination between community college educators and economic development professionals is essential if comprehensive economic development efforts are to be successful.

Conclusions

For ACCD this is a time of historic opportunity, growth, and transformation. The rapid expansion of local aerospace, computer information security, leading industry clusters, and Toyota's selection of San Antonio as the site for its fifth North American manufacturing automotive plant all point to the emergence of San Antonio as a center of research, production and technology. The opportunities and challenges at this time of historic transition require proactive strategies from ACCD. Therefore, ACCD has developed a strategy to collaborate on building a "new economy," one that is regional in scope, leverages technology, focuses on comparative advantages, develops strengths on partnerships and alliances, and provides opportunities for all constituents.

The literature is indicative of the turbulent economic environment for business and higher education's challenging financial environment. This combination of an

extremely competitive economic environment and limited public funding for colleges has provided favorable conditions for partnerships to be formed.

As reflected in Chapter Two, the findings indicate that community colleges' workforce development education programs continue to play a vital role in maintaining and educating a skilled workforce. The ACCD is strategically situated for the greatest impact on San Antonio's workforce transition to the new economy. Specifically, through its workforce development role, the district is ideally positioned to identify and meet the needs of local and regional business and industry as well as provide significant economic development contributions to the San Antonio region. ACCD's workforce programs are systems that connect human resource development and economic development to create a culture for innovation in both areas. The ACCD system offers numerous examples of the kind of fluid, multifaceted role community colleges can play in economic development.

ACCD has recognized that their customized workforce is a critical and integral component of the region's workforce development system, which provides the main foundation for a thriving economy. Likewise, research has established that availability of skilled labor is the most important factor in site location, even more important than labor costs.

As the factor in the Toyota site location decision exemplifies, the availability of a skilled labor force attracts new investment and higher-wage jobs. This implication is expounded in Chapter Two. In retrospect, the successes of ACCD in economic

development have created a new perspective on how community colleges can contribute to larger efforts in this area.

Implications Securing Toyota

In the case of the manufacturing plant, Toyota chose San Antonio because of its long-term team approach that the economic leadership had taken toward marketing the area to manufacturers. Team Toyota took the lead by building a unified team of community leaders who showed Toyota how serious they were about landing the project. The $133 million direct incentive package assembled for Toyota in San Antonio was smaller than those incentives offered by the other three states competing for this project. Toyota's decision to come to San Antonio can be traced directly to Team Toyota's vision, and their unwavering commitment to see it through. Team Toyota had to assemble and manage a team that had never worked together in such a concentrated manner. Toyota executives have repeatedly credited Team Toyota's can-do spirit and leadership as being major factors in the company's selection of the San Antonio site. "San Antonio is a city of the future," declared Fujio Cho, President and CEO of Toyota Motor Corporation, when Toyota's selection was announced.

The Toyota attraction effort created new partnerships that led to significant change within the State of Texas asserted Ms. Rath: "Legislators and community representatives including the education sector alike, mobilized to create a positive business environment for Toyota and for others for years to come."

Fulfillment of Toyota's philosophy is reliant on their employee's education potential. Hence, Toyota believes that the ability to learn successfully is arguably the critical competitive advantage for long-term sustainability. The customize workforce system developed by ACCD effectively addresses these needs.

In conclusion, it was the combination of the economic and political characteristics of San Antonio, as well as the larger region, that convinced Toyota that their production system was capable of being achieved and implemented with the region's workforce and for the new company to become successfully established and productive.

Recommendations

It is clear that community colleges and their relationships with business are an important component of the higher education landscape. A trained and ready workforce is one of the most essential assets a community can offer to expanding or relocating businesses. Hence, the way in which an institution distributes education and training increasingly determines both their economic competitiveness as a region and the apportionment of economic opportunity among its constituents.

Understanding the critical link between education and high paying jobs, institutions must be committed to creating and promoting advanced education and training standards that will produce workers who meet the needs of growth industries. For the Alamo Community College District, the primary challenge is to continue to train students in the rapidly changing skills required of the new economy. As demonstrated in

the context of Toyota Production Systems, students must not only be able to learn specific skills, they must also be able to adapt to an evolving economy.

Input from academic and economic development practitioners, perspectives from the literature, and interviews with the Toyota representatives provided valuable insight as to the increasing and potential role of community colleges in economic development, specifically in corporate recruitment. As a result of this study, the following recommendations have been developed for consideration by economic development and academic leaders for institutions striving to participate in regional economic growth efforts.

Recognize the fundamental and inherent role of workforce development. Workforce is directly linked to economic development. Community colleges must view themselves as central to the effort to train and maintain a competitive regional workforce. Effectuating the impact of workforce development on economic development means that strategies and activities supporting economic growth must be a high priority for institutions. To fulfill this economic role, higher education institutions must affirm the importance of being able to meet the intense demands of the economy. It is, therefore, imperative upon these institutions to focus energy and resources directed toward the relatively new role of providing high-quality, affordable, customized workforce training.

Prioritize the cultivation of partnerships. Strategic partnerships and alliances provide the greatest leverage for addressing the major challenges faced by institutions. Collaboration through strategic partnerships and alliances builds synergy. Importantly,

the Texas Toyota Manufacturing project revealed that partnerships between community colleges, economic development practitioners, and businesses provide one of the most important strategies for maintaining the competitive edge that the global economy requires. As this study of ACCD revealed, this is an achievable goal given the fact that community colleges have traditionally demonstrated the ability to work closely with the local industry to meet the demand for skilled workers.

Transform partnership knowledge into innovation. The forces of transformation for community colleges require that they find new ways to meet the needs of "customers," build the capacity of the college to compete in a global economy, and overcome institutional barriers in order to cultivate innovation and enhance their true institutional transformation to economic development participants. One clear opportunity for leveraging innovation into transformation at community colleges is to integrate fully the knowledge that is derived from partnerships between industry and workforce activities into the operations of the colleges. The relationships between institutions and business provide an ideal mechanism for the economic leadership to respond to the demands placed on the colleges by students, people within the college district, external competitors, workforce needs, state support and regional constituency. Customized training programs, because of their market-driven approach to generating capital, provides an interesting model for institutions to study as they make the overall operations of colleges more market sensitive. As advances in technology and the more demanding needs of industry and employees continue to evolve, community colleges will need to

find new ways to attract and retain business partners and students. A strategic economic development approach for institutions will provide a valuable tool as they attempt to be more regionally responsive to the needs of the constituency.

Capitalize on the Team Toyota project success. In the case of the partnership between Toyota and ACCD, it is the ability of ACCD to document fully what is learned from this paramount economic initiative and use the information to develop new initiatives with existing or new partners. More importantly, it is the ability of the district to collect the knowledge that exists within the Team Toyota leadership and leverage it as a tool for transforming the core economic development functions and activities of the institution as well as their promotional approach to regional economic growth.

Promote the Team Toyota achievement. As noted before, the economic development activities and contributions achieved by ACCD in the San Antonio region are extensive. However, as all of the participants expressed, the general constituency of San Antonio is not well informed or aware of the district's contribution to the economic growth efforts of the region, especially in the instance of the district directly enhancing and accommodating the special needs for the Team Toyota project. Therefore, it is paramount that ACCD develop a positioning strategy that publicly advocates and promotes its regional value to economic development, notably, with the recent Toyota announcement.

The key elements identified—communication, flexibility, responsiveness, convenience, and commitment—are required for institutions to succeed. As higher

education and economic development grow increasingly interdependent, these two different professional groups must maintain effective communication and strategic working relationships. If the Alamo Community College District is to meet their full economic development potential, from the economic leadership perspective, it is imperative that these institutions decisively and effectively communicate their economic development contributions.

Recommendations for Further Research

The purpose of this study was to develop a better understanding and increased awareness of how ACCD responds to the region's economic growth by integrating economic development through workforce training in their selective programs. Specifically, this study identified particular customized workforce programs employed to promote the Team Toyota recruitment. The findings of this study contribute to the understanding of successful workforce activities that can influence the site selection decision making process of key economic initiatives, resulting in positioning community colleges to be critical players in economic development.

Replicate this study nationwide. While this study only focused on one college district in Texas, it would be valuable for economic development practitioners and community colleges to identify similar economic initiatives where automotive manufacturing projects exist, to analyze the contributions made by the college in the promotion of the initiative. More importantly, explore perceptions and values that the

workforce programs generated by the college based on the location decision process made by the automotive company.

Study the changing mission of Texas community colleges. Further study should focus on the economic development role and the different activities employed to respond to the region's economic needs. Further, as in this study, it should identify those that have been most successful in workforce and used strategically with the local economic development leaders to recruit a significant corporation or business venture.

Examine the effectiveness of community college workforce programs from the perspective of state officials and public policy makers responsible for funding and programs in workforce development initiatives. Also, the views of state workforce and economic development boards, and agency executives should be included to add perspective. The members of these groups can provide valuable support for change of current state policies and funding mechanisms to support the increase of public colleges in economic development efforts.

Research other key industries and partnerships in the region. Since this study only explored the perceptions of academic leaders, economic development professionals and executives from one corporation, these participants do not represent the view of other major businesses in San Antonio. Additional research could determine the satisfaction perspectives on the strategies of the district's involvement in economic development activities. This research could assist in determining to what extent these strategies enhance other areas in the region.

Conduct a follow-up study with Toyota Motor Manufacturing. Interestingly, this research would examine the effectiveness of the commitments made by the local Team Toyota group, including the college district, the city and state incentives. Notably, this study should include the district's involvement and the customized workforce activities with prospective Toyota employees. More importantly, the effectiveness of the programs developed to comply with the Toyota Production system. Specifically, this examination would reveal the perspective of the Toyota officials to demonstrate the district's effectiveness and value to the region's workforce and economic development.

APPENDIX A

ACCD STUDENT POPULATION PROFILE

College	White	Black	Hispanic	Other	Female
Northwest Vista	45.1	4.8	45.7	4.4	56.4
Palo Alto College	27.1	2.9	68.4	1.6	61.1
San Antonio College	39.5	4.4	51.5	4.6	58.3
St. Philip's College	27.7	18.8	51.2	2.3	56.4
District	35.6	7.2	53.6	3.6	58.3

Source: Alamo Community College District

APPENDIX B

OCCUPATIONAL TRAINING MATRIX:

TOYOTA ASSEMBLY PROJECT

Workforce Program	Northwest Vista	Palo Alto	San Antonio	St. Phillip's
Accounting Specialist		X	X	X
Administrative Secretary		X		
Administrative Clerk		X		
Business Management		X	X	X
CNC Specialist				X
Collections/Customer Service	X	X	X	X
Design Engineer				
Electro-Mechanical Tech		X		
Engineer for Quality and Misc.			X	X
Environmental Tech				X
Executive Secretary		X		
Facility/Transportation Logistic Specialist		X		
Financial Service			X	
Fuel Cell Technician				X
Human Resource Manager			X	
HVAC Systems Spec/Engineer				X
Industrial /Electronics Engineering			X	X
Information Systems Specialist	X	X	X	X
Machinist/ Precision Metals				X
Manufacturing Engineering Tech				X
Materials Handling				X
Network Engineer				X
Programmer CIM	X		X	X
Quality Management/Lean Manufacturing, TQM, ISO 9000				X
Quality System Manufacturing Engineer			X	X
Robotic Specialist				X
Stamping Specialist				X
Tool and Die Specialist				X

Workforce Program	Northwest Vista	Palo Alto	San Antonio	St. Phillip's
Vehicle Evaluation Engineer				**X**
Warehouse Specialist/Supervisor		**X**		
Waste Treatment Manager		**X**		
Welding Specialist				**X**

APPENDIX C

INTERVIEW GUIDE

SKILL AREAS:

Fluid System

Electrical
Mechanical
Machining/Fabricating

SKILL AREA:
FLUID SYS (HYDRAULICS)
Skills needed:

Basic theory of fluid
Principles of directional valves
Principles of check valves
Troubleshooting of hydraulic circuits
Principles of flow controls
Read prints and schematics

SKILL AREA: FLUID SYS
(PNEUMATICS)
Skills needed:

Understanding of air logic
Rebuild pneumatic components
(such as air cylinders)
Knowledge of components
Troubleshot air-logic circuits with many valves
General knowledge of symbols
Cylinders-how used with special welding application
How solenoids work
Pneumatic braking
Valves
Pneumatic logic diagrams
Convert PSI to Kpa
Venturi vacuums
Flow control
Cylinder balancing
Voltage current to pneumatic signal
Troubleshooting of pneumatic systems
Troubleshoot pneumatic balancing circuits
Control function
Read prints and schematics

SKILL AREA: MECHANICAL
Skills needed:

Understanding mechanical theory, application and repair
Types of metals
Bearings & bushings
Gears and gear boxes
Checking belt drives
Checking chain drives principles
Adjusting chain length
Alignment of motors
Fasteners
Machine structure
Basic rigging
Checking couplings
Understanding lubrication
Aligning sprockets

Inspection for wear of equipment
Rollers
Tools
Cross reference bearing and oil seal type
Shafts-identify thread types-British standard, Metric, national pipe thread
Alignment of rails, chain, lifters
Reducers
Sprockets-checking for wear
linear motion bearings
Alignment of parts
Crimping parts
Broaching keyways

SKILL AREA: ELECTRICAL (electronic)
Skills needed:

Understand basic electronic theory and components
Timers
Replace MOV's on fork truck battery chargers
VFD
Power supplies
Encoders
Proximity switches
Flow meters
Oscilloscopes-interference on communication lines
Electromagnetic theory
Contactors
Light curtains
Stepper motors
Linear transducers
Reed switches
Ultrasonic sensors
Multimeters
Troubleshoot electronic components-working or not working

SKILL AREA: ELECTRICAL
Skills needed:

Grounding
Electromagnetic theory
Troubleshooting electrical circuits
Circuit design
AC and DC voltage
480 volt 3 phase
Run conduit
Limit switches
Contactors
Safety
NEC-know wires, grounding
Motor theory, motor starters
Wiring practices
Relay logic
GFCI
Photo eyes
Relays
Troubleshoot electrical side of electronics

SKILL AREA: ELECTRICAL (PLC)
Skills needed:

Programming with a laptop
Understand ladder logic
Addressing
Remote IO
RS Logix
Software driver configuration-saving
Files and back-up
Troubleshooting with a laptop
Modify logic
Hardware troubleshooting
Flex IO
Panel builder software
Message builder software
Panel builder software

SKILL AREA: MACHINING/FABRICATING (WELDING)
Skills needed:

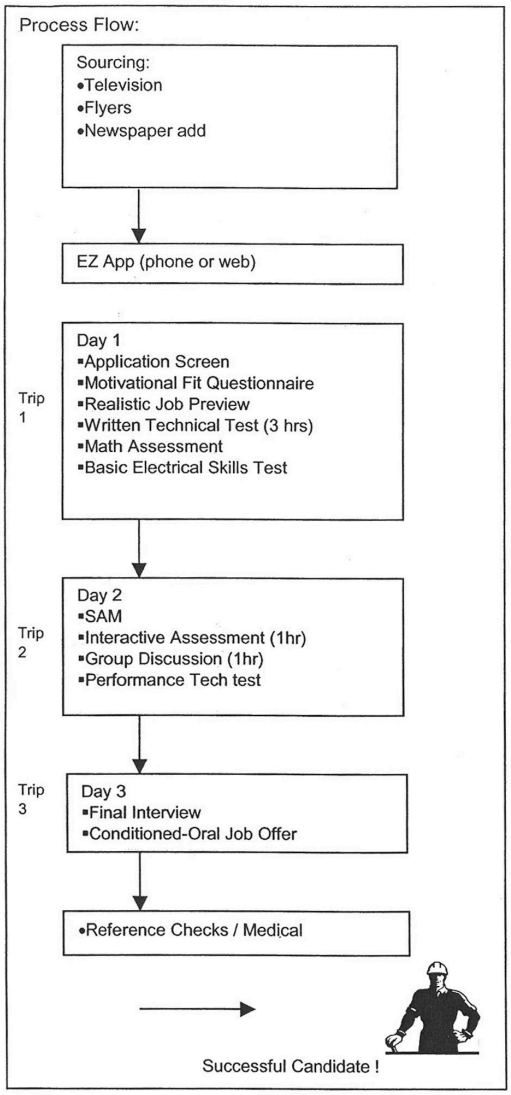
Safety
Metal types
Fabrication
Stick welding
Weld repairs
Rod types and application
Add bracing
Oxy fuel cutting torch

Mig
Sheet metal

SKILL AREA: MACHINING/FABRICATING (FABRICATING)
Skills needed:

Machine tool practices	drills
Sheet metal	milling
Mics and gages	grinding
Fasteners	lathe
Hand finishing	cutting speeds
Metals	
Heat treating	

APPENDIX D



Basic Flow for Skilled Maintenance Selection

Skilled Written Assessment

The written test is a 208 question test broken down into 4 skill areas: Electrical, Mechanical, Hydraulic/pneumatic, and Fabrication/machining. Candidates are required to pass at least one of the skill areas to move on in the selection process. The questions are all multiple choice, with test duration of approximately 3 hours. Answers are recorded on a separate bubble sheet where they are scanned and scored automatically in Selectrack. The Pass score will be set by Toyota (based upon Select International's validation).

Skilled Performance Test

There is a Performance Test (2 hour practical exercise) for each skill area, designed to verify the candidate's hands-on skill. After passing the written assessment, the candidate will take one Performance test. A skilled assessor using a standardized set of criteria for each test assesses candidates. Results are recorded on a bubble sheet where they are scanned and scored automatically in Selectrack. Candidates are required to score 70% to pass the test.

Written Technical Test

Pass Criteria	60% in 1 skill area or 50% in 2 skill areas		
Electrical	Mechanics	Hyd & Pne	Fab & Mach
60%	60%	60%	60%

Performance Technical Test

Pass Criteria	70% or higher on applied test		
Electrical	Mechanics	Hyd & Pne	Fab & Mach
70%	70%	70%	70%

4/27/2004

Overview of Performance Assessment

Electrical

Time	Performance Task	Equipment Needed
1.25 hours	**Task 1** - Wire 3 phase reversing control circuit with bi-directional jog using supplied training module.	3 phase control panel training module
.75 hours	**Task 2** - Draw a PLC ladder logic program to meet set criteria.	PLC Trainer

Mechanical

Time	Performance Task	Equipment Needed
1.1 hours	**Task 1** - Using a drill press, layout and machine fixture plate according to specification.	Drill press and blank metal plates
.9 hours	**Task 2** - Using drive alignment module, select, install, and align pulley for designtaed speed.	Mechanical drive alignment trainer

Hydraulic / Pneumatic

Time	Performance Task	Equipment Needed
.7 hours	**Task 1** - Draw a hydraulic circuit consisting of manual valve, 2 cylinders, flow control, motor and resevoir according to given specifications.	Pneumatic Training unit
1.3	**Task 2** - Using training module, construct specified circuit and troubleshoot	

Fabricating / Machining

Time	Performance Task	Equipment Needed
1.5 hours	**Task 1** - Using milling machine, setup and machine block according to specifications	Vertical milling machine
.5 hours	**Task 2** - Setup and weld horizontal fillet T-joint weld using supplied plates	Mig welder and weld coupons

Tool and Die

Time	Performance Task	Equipment Needed
1.5 hours	**Task 1** - Using milling machine, setup and machine block according to specifications	Vertical milling machine
.5 hours	**Task 2** - Setup and weld horizontal fillet T-joint weld using supplied plates	Mig welder and weld coupons
2 hours	**Task 3** - Lathe Operation	Lathe
2 hours	**Task 4** - Hand Finishing	Hand Tools

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VITA

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